# PIT AND QUARRY

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OCT - 4 1940
PERIODICAL DIVISION

OCTOBER, 1940

American Aggregates' New Columbus Plant . . . Trucks Cut Intra-Plant Hauling Costs
The Lubrication of Screens . . . Resettlement Workers Operate Crushed-Stone Plant

# HAZARD LAY·SET *Preformed*

IS SAFER
LASTS LONGER
HANDLES EASIER
RESISTS KINKING
SPOOLS BETTER
RESISTS ROTATING
GIVES GREATER
DOLLAR VALUE

● The seven points at the left make a big statement, but every word is *true*. In fact, there are other important merits about Hazard LAY-SET Preformed that we haven't space to mention here.

Hazard LAY-SET is put through a scientifically calculated preforming process at the mill. This process eliminates the internal strain present in non-preformed rope. This relief from stresses makes LAY-SET a rope that is relaxed and willing to work. Every wire has amazing resistance to bending fatigue (and therefore lasts longer). Being flexible and limber, LAY-SET is easy to handle. Broken crown wires do not wicker out to jab workmen's hands. These are some of the other qualities which make Hazard LAY-SET Preformed the wire rope of greater dollar value, as operators now using LAY-SET Preformed will tell you.

**HAZARD WIRE ROPE DIVISION • WILKES-BARRE, PA.**
*Established 1846*
**American Chain & Cable Company, Inc.**
District Offices: New York, Chicago, Philadelphia, Pittsburgh, Fort Worth, San Francisco, Denver, Los Angeles, Atlanta, Tacoma

GREEN SIGNIFIES SAFETY

**LAY·SET *Preformed* WIRE ROPE**

# Here's how LINK-BELT
## CAN SERVE YOU IN CUTTING MATERIALS HANDLING and POWER TRANSMISSION COSTS

**You Men** of the non-metallic mineral industries of the nation, depend upon scientifically planned elevating, conveying, washing, classifying and power transmitting equipment to cut production costs.

Let Link-Belt—pioneer builders of equipment of this kind—65 years young this year—serve you with new ideas—new products—better and more effective equipment. Our research laboratories were never busier and our creation of improvements never greater than today.

Talk over your plans for simpler, more efficient low-cost handling, preparation and power transmitting methods with experienced Link-Belt engineers. We like to solve problems of this kind and you can profit by our years of practical experience, combining the new with the tried-and-proved, in serving Industry the world over.

**LINK-BELT COMPANY**

*The Leading Manufacturer of Equipment for Handling Materials and Transmitting Power* 8266A

Chicago Indianapolis Philadelphia Atlanta Dallas San Francisco Toronto
Branch offices, warehouses and distributors located in principal cities

Shovel-Dragline-Crane DIVISION—LINK-BELT SPEEDER CORP.
Chicago and Cedar Rapids

**A Library of Useful Information**

**on Elevating, Conveying and Power Transmission Machinery. Binder 2100 contains eight complete catalogs bound as one book, covering the complete Link-Belt line of Positive Drives—Silent and Roller Chain Drives, Speed Reducers, and P.I.V. Gear Variable Speed Transmissions. General Catalog No. 800 contains 1278 pages of engineering data, dimensions and list prices—the most complete data book and catalog ever published on elevating, conveying and power transmission machinery.**

√ **BELT CONVEYORS** We manufacture all of the popular sizes of anti-friction belt conveyor idlers with cast iron and steel rolls, for light, medium and heavy duty service. For extra heavy service where large, sharp lumps are conveyed, rubber-covered conveyor rolls are available. We also manufacture belt trippers, speed reducers, bearings, pulleys, take-ups, self-aligning idlers —in fact, complete belt conveyor equipment.

√ **CONVEYORS, FEEDERS, SHOVELS** Link-Belt conveyors and feeders are obtainable in practically all types and weights to meet every handling need—belt, apron, pan, bucket, screw, bulk-flo, etc. Also skip hoists, car dumpers and pullers, power shovels-draglines-cranes.

√ **BUCKET ELEVATORS** A large range of types and sizes for each and every operating condition and requirement.

√ **CHAINS** Pioneers in the art of chain-making, Link-Belt today manufactures chains of malleable, Promal, steel, stainless steel, bronze and alloys in numerous types and sizes, for every service in conveying and power transmitting.

√ **POSITIVE DRIVES** You can solve your drive problems with Link-Belt *positive* drives—Silverstreak silent chain drives; Silverlink roller chain drives; herringbone gear, worm gear and motorized helical gear speed reducers, and P.I.V. Gear variable speed transmissions. Profit by the knowledge and experience of the Link-Belt organization.

√ **CLASSIFIERS** Link-Belt offers five types of settling and dewatering devices to meet varying conditions as found in different pits. These units—the Rotoscoope, the dewatering flight conveyor and screw conveyor, the Shaw classifier and the automatic conical separator—have been developed to give the degrees of grading, cleansing or dewatering to meet local specifications.

√ **SCREENING** The Link-Belt line includes screens of the bar, grizzly, revolving, and inclined conical types —including the famous Link-Belt vibrating screen. Whatever your problem in screening or separating, consult Link-Belt. Send for Vibrating Screen Catalog 1762.

√ **POWER TRANSMISSION** You buy cost-cutting stamina in Link-Belt equipment. Developed for exacting elevator and conveyor uses, these dependable units deliver peak-performance in general power transmission service. Babbitted and anti-friction bearings—take-ups —clutches—couplings—collars—pulleys—gears . . . everything you need.


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| | Vacuum Control | Ind. Chain Crowd | 175 F.P.M. Min. Hoist Speed | Tubular Dipper Stick | Shatter-Proof Glass | Max. Digging Radius 23' 2" | Max. Dump Height 17' 4" | Safety Power Drum Brakes | Min. 5.25 R.P.M. Swing | 2.25 M.P.H. Top Travel Speed | Simultaneous Swing, Hoist, Travel | 4-Anti-F. Bearinged Hook Rollers | A.F.-Bearings on Main Mchy. Shafts | Min. 16" Crawler Treads | Min. 10'-2¾" Crawler Length | Ample Work Space in Cab | Power Boom Hoist and Safety Brake | Flame Hardened Gears | Automatic Swing Brake | Over 12½" Ground Clearance | Gear, Universal Power Hook-Up | Vacuum Power Trip | Over 57 H.P. Rating | Weight over 27,000 lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clipper Model 50 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Shovel No. 2 | No | No | Yes | No | No | No | No | No | No | No | No | No | Yes | Yes | Yes | No | Yes | No | No | Yes | Yes | No | Yes | Yes |
| Shovel No. 3 | No | No | No | No | No | Yes | No | No | No | No | Yes | No | No | Yes | Yes | Yes | No | Yes | No | Yes | No | No | No | Yes |
| Shovel No. 4 | No | Yes | No | No | Yes | Yes | Yes | No | Yes | Yes | | | | No | Yes | No | No | No | No | Yes | No | No | No | No |
| Shovel No. 5 | No | Yes | No | No | No | Yes | Yes | No | Yes | No | | | | Yes | Yes | Yes | No | No | No | Yes | No | No | No | Yes |
| Shovel No. 6 | No | Yes | Yes | No | No | Yes | Yes | No | Yes | | | | | Yes | Yes | No | Yes | Yes | No | No | Yes | No | No | No |
| Shovel No. 7 | No | Yes | Yes | Yes | No | Yes | Yes | No | | | | | No | Yes | No | No | No | No | No | No | No | No | No | Yes |
| Shovel No. 8 | No | Yes | Yes | No | No | Yes | Yes | No | | | | No | No | Yes | Yes | No | | Yes | | | | No | No | Yes |
| Shovel No. 9 | No | No | Yes | No | No | No | No | | | | | No | No | Yes | Yes | No | | | | | | No | Yes | Yes |
| Shovel No. 10 | No | No | Yes | Yes | Yes | Yes | No | | | | No | No | No | No | Yes | No | No | | | | | No | No | Yes |
| Shovel No. 11 | No | Yes | No | No | Yes | Yes | | | | | No | No | No | | | | | | | | | No | No | Yes |
| Shovel No. 12 | No | Yes | Yes | No | Yes | | | | | | | | | | | | | | | | | | | |

# Vacuum Control ✓ Plus 23 Clipper Preference Points!

In addition to being the original vacuum control power shovel, Clippers feature 23 other design and operating advantages that appeal to every smart shovel buyer. Greater daily yardage, lower operating cost, minimized maintenance and added years of faithful service are assured by these 24 features, as provided only by Buckeye Clippers.

Readily convertible to dragline, trench hoe, crane or pile driver, Clippers are the sound investment for every digging, loading, dirt moving and materials handling job. No shovels offer so much for so little.

Check the 24 Clipper preference points above — know why Clippers are preferred.

If you have a trenching or drainage job, use a Buckeye Trencher for top profits. Wheel and boom type models of every capacity. Write for details.

Three rugged, fully convertible models:

Model 50 ✓ ½ yard

Model 60 ✓ ⅝ yard

Model 70 ✓ ¾ yard

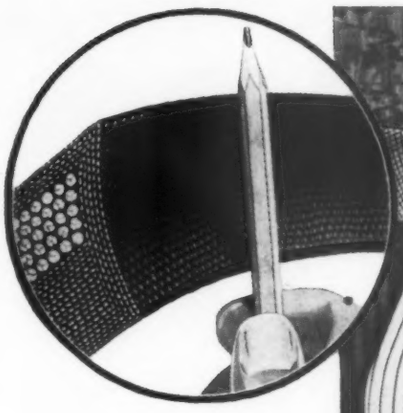
# Buckeye ✓

THE BUCKEYE TRACTION DITCHER CO. FINDLAY, OHIO

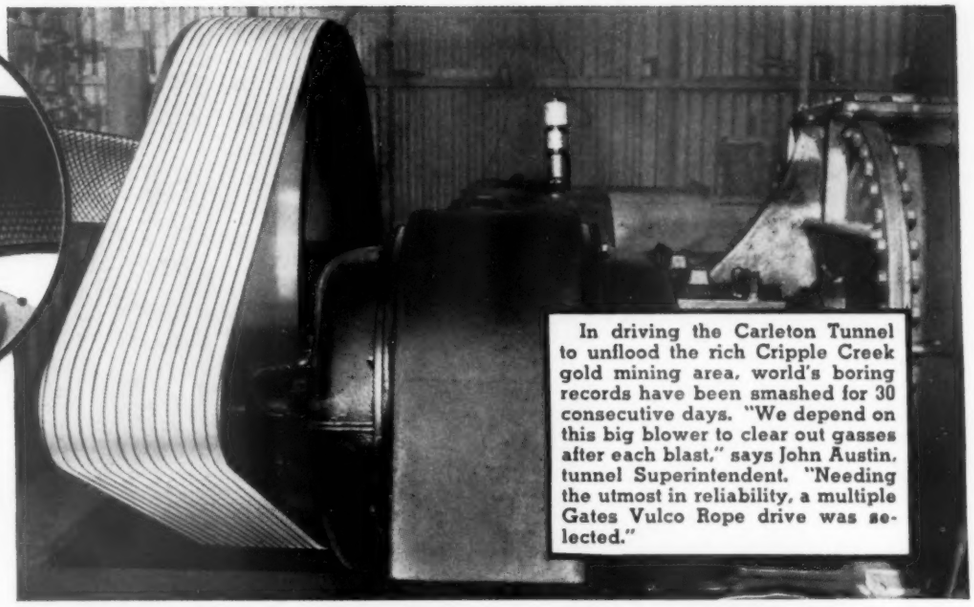
Makers of Trenching Machines, Convertible Shovels, R-B Finegraders, Surface Graders, Spreaders and Tractor Equipment

Distributors in All Principal Cities

Check Buckeye First!



The **Concave** Side
IS A GATES PATENT



In driving the Carleton Tunnel to unflood the rich Cripple Creek gold mining area, world's boring records have been smashed for 30 consecutive days. "We depend on this big blower to clear out gasses after each blast," says John Austin, tunnel Superintendent. "Needing the utmost in reliability, a multiple Gates Vulco Rope drive was selected."

# Let this Simple Test

## Tell you its own story of

# SAVING

## in V-Belts and Power

It's a simple matter to learn for yourself how a V-belt with a concave side saves your money.

Just take any V-belt and bend it (as illustrated in the photo above). As the belt bends, grip its sidewalls between your finger and thumb. You will feel those sides bulge outward.

If the belt is a straight-sided belt this bulging gives it a shape like that shown in figure 1 (on the left). Clearly this shape does not fit the sheave groove.

**What Happens When a V-Belt Bends**

But when you bend a belt that is built with the patented Concave side, you find that the sides become perfectly straight—as shown in figure 2. Here are the advantages: This shape exactly fits the sheave groove; this means uniform sidewall wear—*longer life!* Also, the *full* side of the belt is gripping the pulley; therefore less slippage and this saves belts as well as power.

The Gates Vulco Rope is the only V-belt built with the Patented concave side.

**V-Belt in Sheave**

It's the *sides* of a V-Belt that do all the *gripping* and get all the *wear*. That's why longer life for the *sides* means *longer life for the belt.*

## THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

# GATES VULCO ROPE DRIVES

CHICAGO, ILL., 1524 South Western Ave. HOBOKEN, N. J., Terminal Building BIRMINGHAM, ALA., 1631 1st Ave., S. LOS ANGELES, CAL., 2240 E. Wash. Blvd.

DENVER, COLO., 999 South Broadway DALLAS, TEX., 2213 Griffin Street PORTLAND, ORE., 333 N. W. 5th Ave. SAN FRANCISCO, CAL., 2700 16th St.

# NEW LOW COST TYPE "R" CRUSHER

# TAKES LESS TIME OUT

WITH A FEW TWISTS on the hand crank, you can get any setting you want. Driven by a Lo-Maintenance Motor and Texrope Drive, the new Type "R" gives you reliable, low-cost operation.

**Let Allis-Chalmers Cooperative Engineering help you cut your operating costs!**

# for SETTINGS . . . for TRAMP IRON . . . for POWER INTERRUPTIONS!

**Three-Way Time-Saving Features of New Allis-Chalmers Type "R" Crusher Give you Quantity Production of Uniform, Cubical Product . . . at LOWER COST! Read This Money-Saving News about the Fast-Selling Type "R" You Can Get at a Price Below Any Comparable Fine Reduction Crusher on the Market Today!**

WE SINCERELY believe the new Type "R" Crusher is the answer to the industry's demand for a low-cost crusher capable of high capacities . . . a uniform, cubical product. And here's why!

**LESS TIME OUT FOR SETTING!** You can change settings for size with the Type "R" *in less time* . . . with a few twists of a hand crank. Built-in hydraulic jack does the work for you . . . gives you an exact setting anywhere within the range of this modern, low-cost crusher.

**LESS TIME OUT FOR TRAMP IRON!** You get greater protection from tramp iron with the Type "R". The effective release device passes ordinary tramp iron *fast* . . . protects your crusher . . . minimizes outage time.

**LESS TIME OUT FOR POWER INTERRUPTIONS!** Here's what actually happened in a large eastern crushing plant when a power interruption left the crushing chambers jammed with feed. It took 2½ hours to put their ordinary crusher back in operation . . . but their Type "R" was turning out stone after only a 15 minute delay! Think what dividing your lost production time by *ten* could mean to the production schedule in your plant!

Remember . . . 322 Type "R" Reduction Crushers are carried in stock . . . ready for immediate delivery anywhere! And here's the clincher — you get the Type "R" Crusher with all its money-saving features at a *cost that's actually less* than you pay for any comparable machine on the market today!

**Get Cost-Cutting Service!**

When you install a Type "R" Crusher . . . or any one of the complete line of Allis-Chalmers products . . . you're sure you get equipment that gives you long years of cost-cutting service.

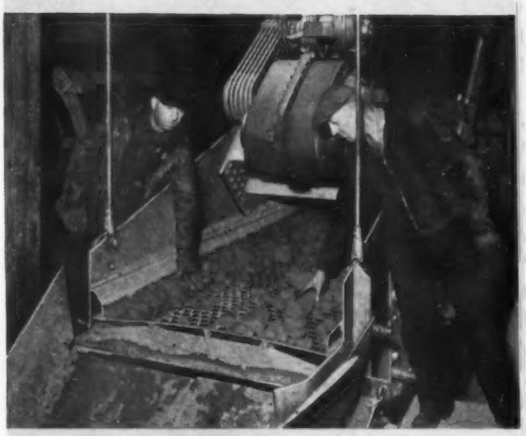
Whenever you have a problem that needs real engineering, Allis-Chalmers cooperative engineering can save you money. Working with your own engineers, the Allis-Chalmers crushing specialists will be glad to analyze your problem . . . give you an unbiased recommendation for the most economical solution. Get in touch with the district office near you, or write direct to Allis-Chalmers, Milwaukee, Wis.

A 1210

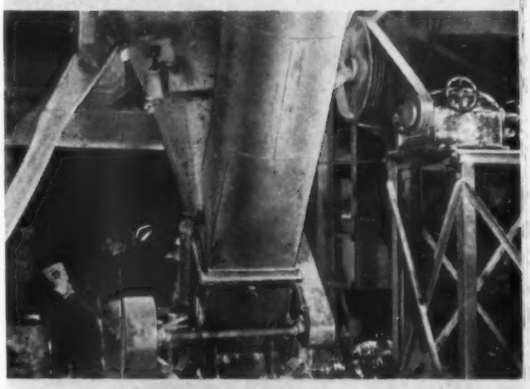
# ALLIS-CHALMERS

MILWAUKEE · WISCONSIN

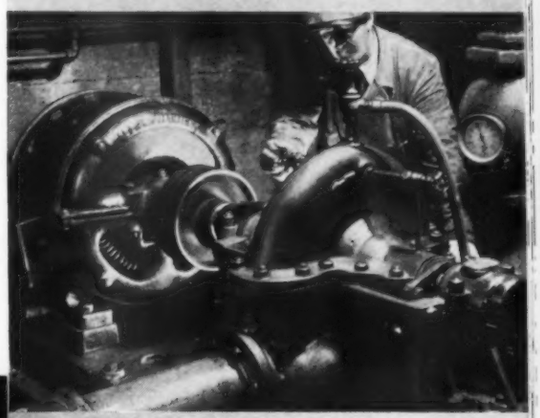
*News of other Allis-Chalmers Products that cut your costs!*



IN CRUSHING PLANTS ALL over the country, the Allis-Chalmers Low-Head is proving why it's the fastest selling screen on the market today. Space-saving adaptability plus positive vibration give you a better product at lower cost.



SENSITIVE, RELIABLE VA-riable speed control is obtained with the Allis-Chalmers Vari-Pitch Speed Changer. Here is a unit driving a separator in a mid-western lime plant.



MORE WATER AT LESS cost . . . that's the reason Allis-Chalmers centrifugal pumps are a favorite among operators for washing, drainage and allied crushing plant applications.

# IN THE TIMKEN REMOVABLE ROCK BIT

THE shoulder takes the shock. There is definite clearance between the end of the steel and the bottom of the bit. The function of the threads is only to hold the bit on the steel. The contour is streamlined. The bit is uniformly deep hardened. It is made of world-famous TIMKEN Electric Furnace Alloy Steel. To the user these features mean: (1) absence of "bottoming", (2) easy removability, (3) less "stuck" steel, (4) more footage per bit, (5) faster cutting—in short, drilling costs reduced to the lowest levels ever recorded.

## A FULL COMPLEMENT OF TIMKEN BITS FOR EVERY DRILLING JOB

The TIMKEN "H" Series Bit. A general purpose bit for contracting, mining, and quarrying to be used with light and medium weight drills. Comes in either side or center hole in sizes from 1⅜" to 2¼" gauge inclusive.

The TIMKEN "M" Series Bit. The "M" Bit is an intermediate type recommended when the "H" series proves too light and the heavy duty "D" series is not required. The "M" Bit is manufactured only with a center hole and is available in a limited range of sizes including 2", 2⅛", 2¼" and 2⅜".

The TIMKEN "R" Series Bit. Often referred to as the "rose" bit, the "R" series is used in soft formations like limestone and sandstone. It comes in either side or center hole in gauges 1⅜" to 2⅜" inclusive.

The TIMKEN "J" Series Bit. This type if often called the "chisel" bit. It is designed for hard formations and ravelled rock. It is furnished with side hole only in sizes from 1⅜" to 2¼" inclusive.

The TIMKEN "D" Series Bit. A heavy section bit for heavy mining and general quarrying to be used on wagon drills and tripod drills or other applications where large sections of drill steel and heavy machines are required. This bit comes in either side or center hole in sizes from 1¾" to 3" gauge inclusive.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

# TIMKEN
## ROCK BITS

# FOR MORE PRODUCTION . . . MORE PROFITS . . . TRY

# THE TOURNAPULL METHOD

Model C Tournapull with W-10 Tournatrailer (12 heaped yards), working in a pit near Peoria, Illinois.

### *This Revolutionary, New Earthmoving Unit Gives You Pull of a Tractor, Speed of a Truck*

Now you can spread the low costs of stripping with LeTourneau Carryall Scrapers to longer hauls by using Tournapulls. This fast-moving, self-powered unit first cuts your pit and quarry costs on overburden removal. Then, on shovel work, you can cut equipment costs by switching the Tournapull from Carryall to Tournatrailer operation. Change is easily and quickly made, enables you to use the same power for hauling aggregates that strips your overburden.

"Flotation," provided by the Tournapull's large tires, gets big loads across soft ground that bogs down conventional hauling equipment. Full engine power and weight concentrated on two big-diameter, rubber-tired drive wheels, give you far greater traction than is possible with smaller tired 4-wheel drive units.

Two years of Tournapull operation on some of the country's toughest jobs have proved conclusively that this equipment will travel over uneven ground with bigger loads and at higher speeds than do trucks. No other method available on the market today can move so much yardage so fast and cheaply. Best place to investigate the savings is right in your own pit. See for yourself . . . by a demonstration . . . what the Tournapull can do for you. Ask your LeTourneau-"Caterpillar" dealer TODAY!

**A QUICK GET-AWAY**—Speeding a big load to the waste area. In dumping, the Tournatrailer body slides back over a fixed bed, practically 'dozing the load out the back, thus eliminates load sticking in extremely wet, rubbery materials. Tournatrailers will dump over a bank or "spread" loads on the move.

**TOURNAPULL CUTS STRIPPING COSTS . . .** picks up maximum loads fast with the aid of a pusher, hauls those loads at truck speeds, spreads in even layers, thus leaves pit and waste area in a clean-cut condition. No other stripping method can handle both shallow and deep cuts as efficiently as the Carryall. Model shown is LS Carryall (11 heaped yards), with Model C Tournapull.

**LE TOURNEAU**

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

**TOURNAPULLS*, TOURNATRAILERS*, CARRYALL* SCRAPERS, ANGLEDOZERS*, BULLDOZERS, ROOTERS*, POWER CONTROL UNITS, CRANES, DRAG SCRAPERS, SHEEP'S FOOT ROLLERS, PUSHDOZERS, TREEDOZERS. *Name Reg. U.S. Pat. Off.**

# THE ECONOMY TRUCKS

# FORD

Big jobs are in the making for 1941. They're jobs that have got to be done fast, efficiently, economically. Here are the 1941 Ford Trucks that are built to meet these present-day dimensions for dollar-saving dependability.

They "have everything." Choice of power. Range of wheelbases. Wide range of body and chassis types. And the kind of economy that really counts — *over-all* economy.

The 95-hp Ford V-8 engine has an extra margin of horsepower not offered in any other low-price truck, and sells at several hundred dollars less than any other truck with equal horsepower rating. The 95-hp engine is teamed up with the famous Ford 85-hp engine that has proved its dependability and economy in billions of miles of payload performance.

There's new styling and there are many new improvements and refinements. Above all, there is the down-to-earth quality and economy that have made Ford V-8 a symbol of dollar-saving performance in nearly every kind of hauling and delivery work.

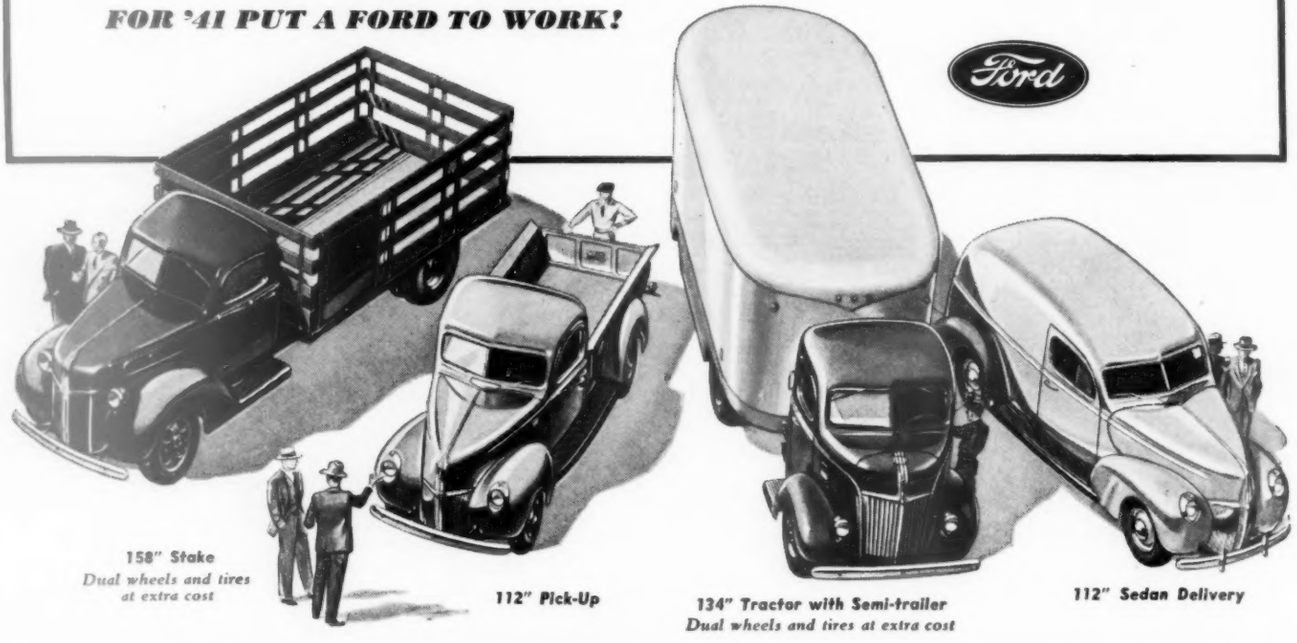
See the Ford V-8 Truck at your Ford dealer's. Put one to work on your job and test it your own way. Prove to yourself that this is the unit to do your job, in less time, at lower cost.

## 1941 FORD FEATURES

**Two V-8 engines — 95 and 85 hp ★ New 4-cylinder 30-hp engine for maximum economy in Commercial Cars, ¾ and One-Ton Trucks ★ Six wheelbases — 42 body and chassis types ★ Full-floating rear axles in all trucks — ring gear thrust plate ★ ¾-floating axle in Commercial Cars ★ Straddle-mounted driving pinion ★ Big hydraulic brakes ★ Two-speed axle as well as reinforced frame in trucks for heavy-duty service are optional at extra cost.**

*Ford Motor Company, builders of Ford V-8 and Mercury Cars, Ford Trucks, Commercial Cars, Station Wagons and Transit Buses*

***FOR '41 PUT A FORD TO WORK!***




158" Stake
*Dual wheels and tires at extra cost*

112" Pick-Up

134" Tractor with Semi-trailer
*Dual wheels and tires at extra cost*

112" Sedan Delivery

# BORN TO ROCK WORK

NORTHWESTS are designed and built for the toughest job they will be called upon to perform. They are Rock Shovels and work on some of the country's toughest contracts have *PROVED THEM* to be *ROCK SHOVELS.*

With the Northwest Dual Independent Crowd you have available a force that other shovels waste. It means money in any kind of going! With the Northwest Welded Boom and Dipper Sticks (and no Northwest Welded Boom has ever failed), you have a husky front end that will stand up against punishment. And behind these advantages is Northwest power—plenty of power that hangs on in tough going and withstands the drag down loads that rock digging calls for with a full dipper at the end of each cut.

Add to these features the "feather-touch" control, the Cushion Clutch and Northwest Uniform Pressure Swing Clutches and you have a combination that has proved hard to equal.

GASOLINE • ELECTRIC • DIESEL • OIL

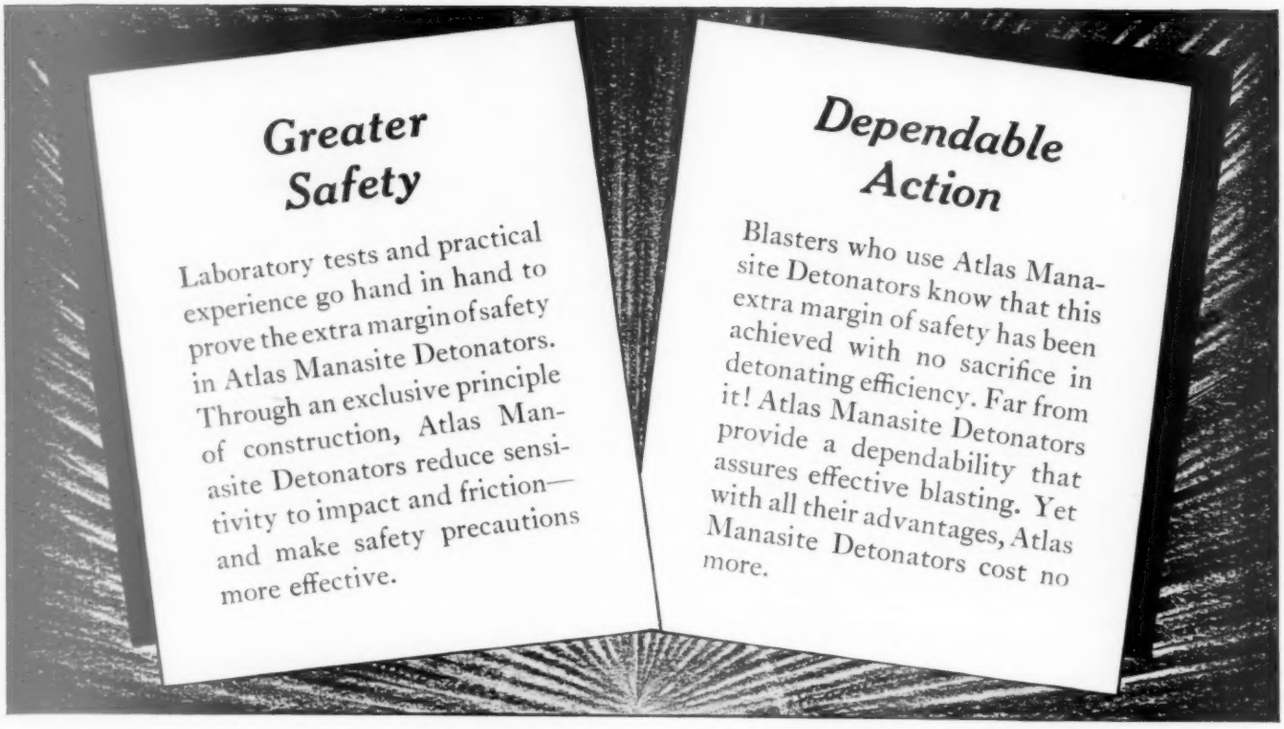
Built in a range of 18 SIZES 3/8 yd. capacity and Larger

NORTHWEST ENGINEERING COMPANY
1822 Steger Bldg., 28 E. Jackson Blvd., Chicago, Ill.

# NORTHWEST

SHOVELS . CRANES . DRAGLINES . PULLSHOVELS

*-and when you have a real Rock Shovel you won't have to worry about output in dirt*

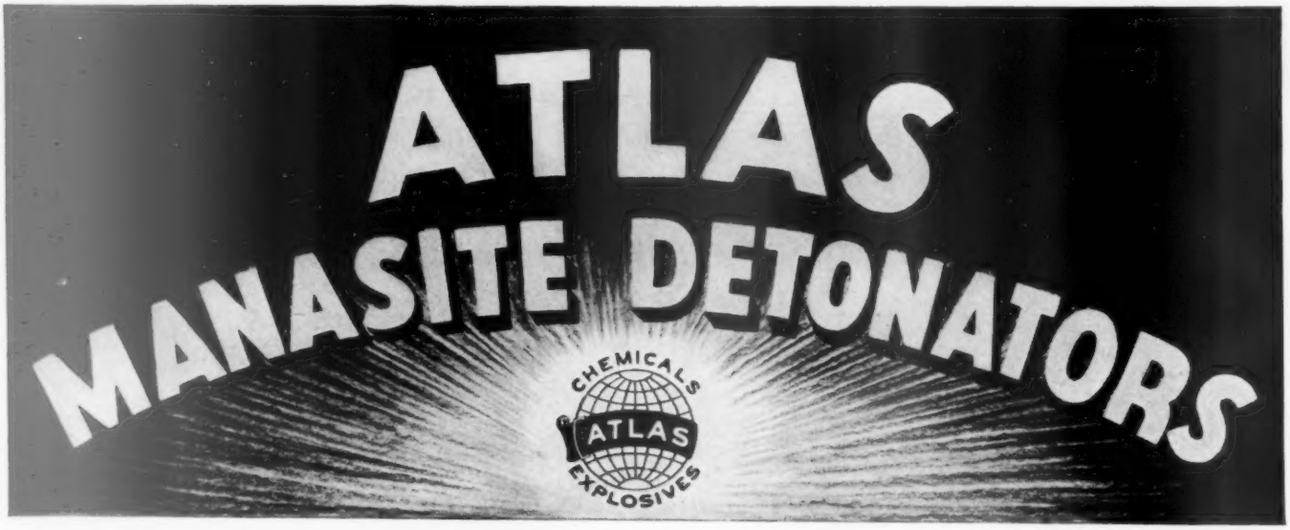

Greater Safety
Laboratory tests and practical experience go hand in hand to prove the extra margin of safety in Atlas Manasite Detonators. Through an exclusive principle of construction, Atlas Manasite Detonators reduce sensitivity to impact and friction—and make safety precautions more effective.
Dependable Action
Blasters who use Atlas Manasite Detonators know that this extra margin of safety has been achieved with no sacrifice in detonating efficiency. Far from it! Atlas Manasite Detonators provide a dependability that assures effective blasting. Yet with all their advantages, Atlas Manasite Detonators cost no more.

*Here's the Proof—*

# Over Eighty Million Atlas Manasite Detonators Already Have Been Used

***Everything for Blasting***

ATLAS POWDER COMPANY, WILMINGTON, DEL.



*For Pennsylvania's Turnpike*

# TELSMITH EQUIPMENT

*Served in These Twelve Commercial Quarry Plants*

Contractors' Service Corp.
Shade Gap, Pennsylvania

Chambersburg Stone Co.
Chambersburg, Pa.

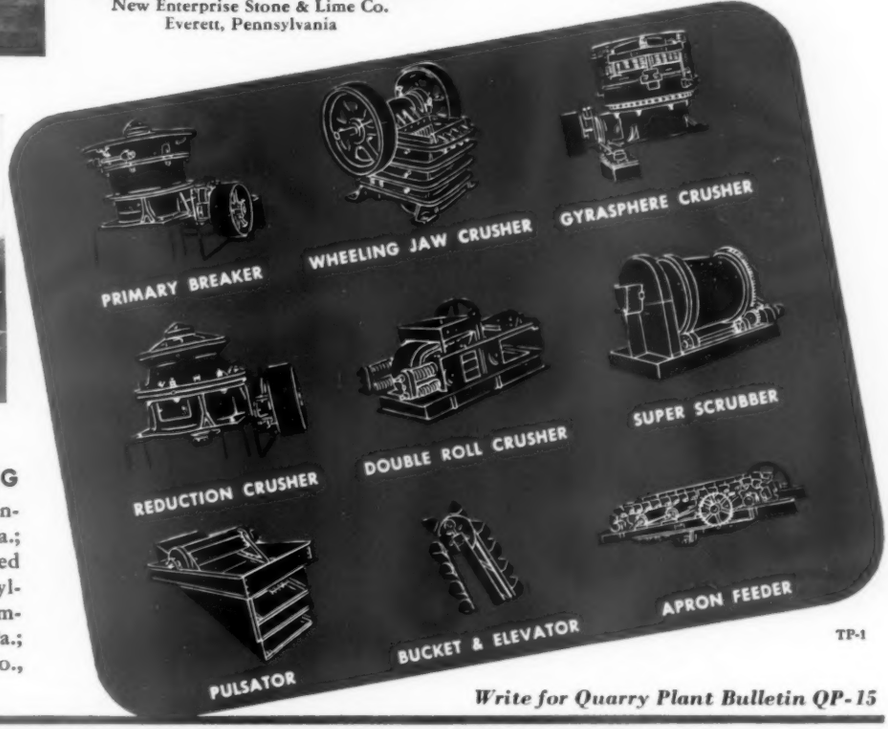
Shippensburg Stone Co.
Shippensburg, Pa.

New Enterprise Stone & Lime Co.
Everett, Pennsylvania

Binkley Bros. & Ober
Dry Run, Pennsylvania

H. B. Mellott
McConnellsburg, Pa.

**OTHER PLANTS (not shown) USING TELSMITH EQUIPMENT:** Hunkin-Conkey Construction Co., Somerset, Pa.; J. F. Sours, Carlisle, Pa.; Vang Crushed Stone Co., Connellsville, Pa.; Pennsylvania Supply Co., Harrisburg, Pa.; Lycoming Silica Sand Co., Montoursville, Pa.; New Enterprise Stone & Lime Co., Roaring Springs, Pa.




TP-1

*Write for Quarry Plant Bulletin QP-15*

**SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN**

50 Church St. New York City
713 Commercial Trust Bldg. Philadelphia, Pa.
81 Binney St. Cambridge, Mass.
Roanoke Trac. & Eqpt. Co. Roanoke, Va.
Charleston Trac. & Eqpt. Corp. Charleston, W. Va.
Brandeis M. & S. Co. Louisville, Ky.

# 41% Repeat Orders

## for KOEHRING Dirt and Rock Hauling EQUIPMENT

DUMPTOR

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**KOEHRING COMPANY • Milwaukee, Wisconsin**

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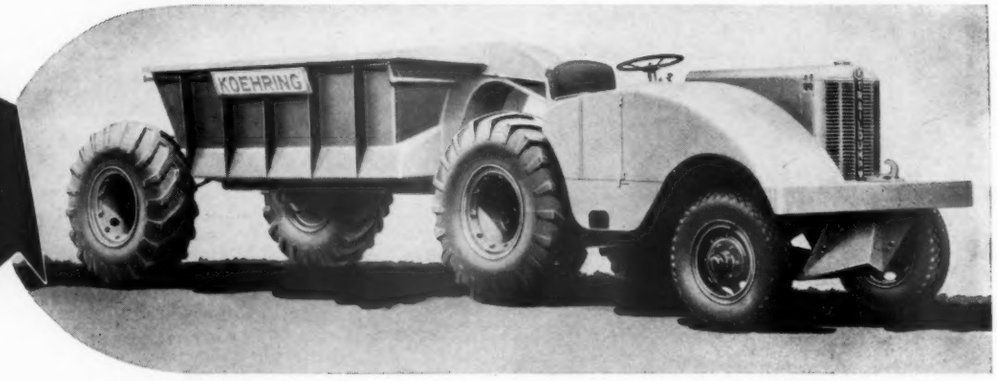
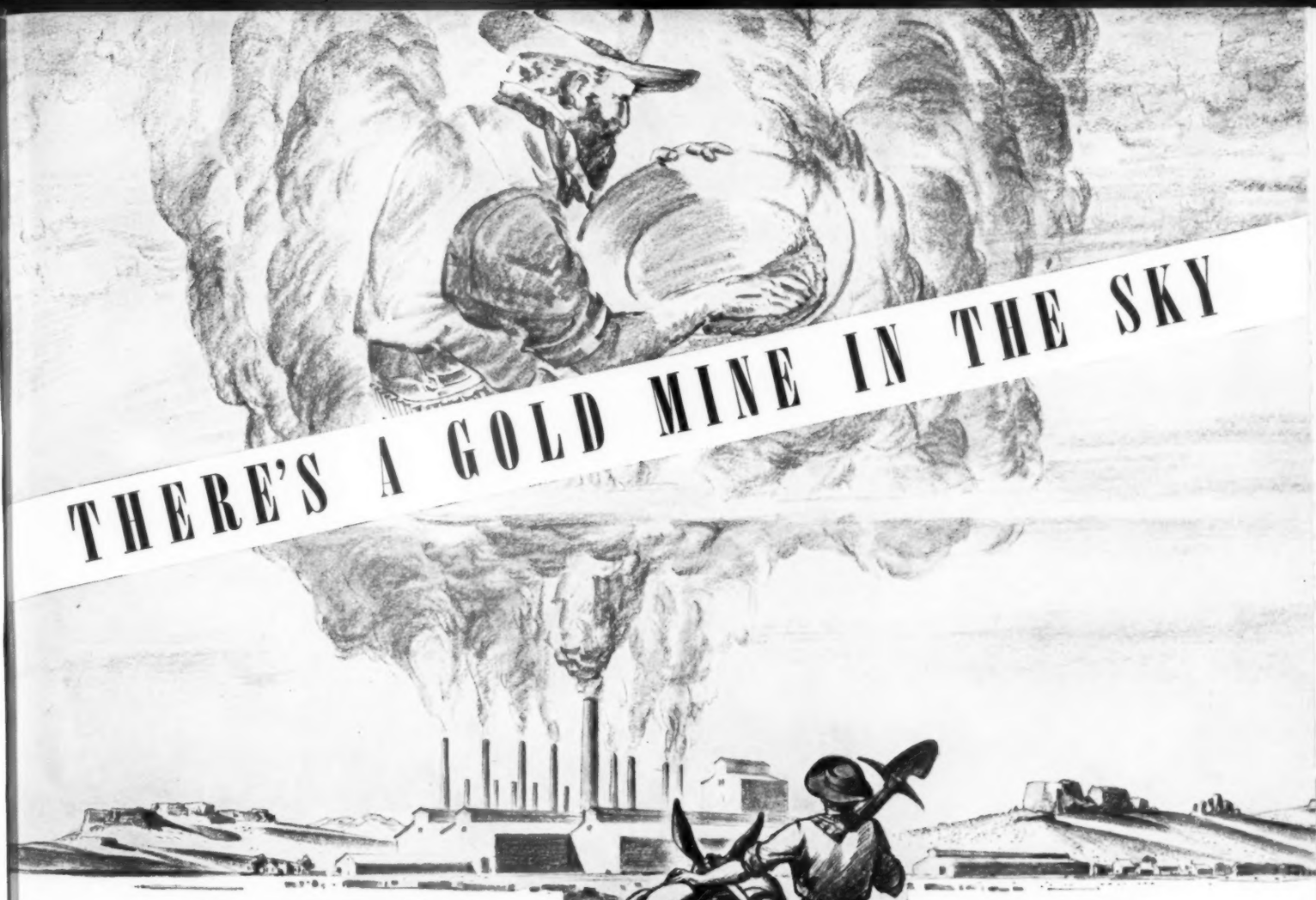


WHEELER

**HEAVY-DUTY CONSTRUCTION EQUIPMENT**



# THERE'S A GOLD MINE IN THE SKY

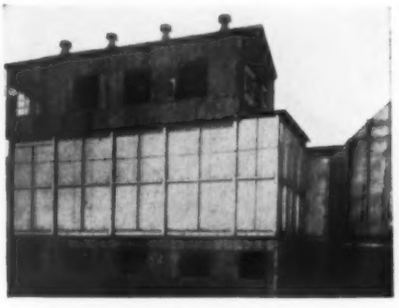
• *Ninety-one years ago gold was discovered in California. Since then real gold worth millions of dollars has gone up into the sky unnoticed in fumes from smelters.*

• When this loss was suspected and smelter fume was analyzed, an amazing discovery was made—that not only gold, but also silver, copper, lead and all other elements found in the ores were being lost forever from smelter stacks.

• Thirty-four years ago the Cottrell Process of Electrical Precipitation was first used to collect acid mist at a gold and silver smelter, and soon afterwards it was found that it would collect all the microscopic metallic values that had formerly been lost in fugitive fume.

• The Cottrell Process is the original, basic, universal method of collecting all kinds of solid and liquid particles suspended in any gas. A Cottrell will collect and deliver everything down to infinitesimal, invisible sizes, red hot or ice cold, wet or dry. This function of the electrostatic field makes Cottrells the outstanding equipment for all dust and fume producing industries: mining, rock products, chemical, power, gas and steel.

Where the exceptionally high efficiency of Cottrells is not required, low cost dust recovery is obtained with Multiclone mechanical collectors. Multiclones are the original small tube collectors with exclusive features developed theoretically and by international experience. They are all-metal, compact, fireproof and have no parts to repair, clean or replace. Multiclones are built for any gas volume, from a few c.f.m. to millions. The collection efficiency of Multiclones includes particles down to 3 microns or smaller.



*Cottrell Electrical Precipitator collecting cement dust. Average recovery is 100 pounds per barrel of production, most of which is returned to the kilns.*

## COTTRELLS IN THE CEMENT INDUSTRY

The principal advantage resulting from the use of Cottrells in cement plants is the elimination of the heavy dispersion of dust over the surrounding area. In many cases, however, most of the recovered dust is returned to the kilns. The dust being collected by all the Cottrells now being operated in cement plants amounts to many thousands of tons a day.

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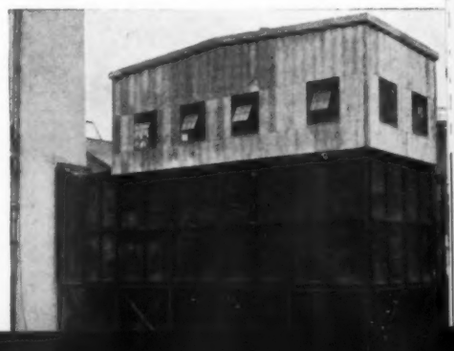
# COTTRELLS MULTICLONES



# The Year-Long Advertising Medium for Your Products—1941 Edition Closes Dec. 15

Pit and Quarry Handbook offers complete sales coverage for a full 12 months . . . in a year that promises, because of our National Defense Program, to be tops in demand for basic building materials. Catalog your products in this one and only Buyer's Manual of the industry—reach every prospect who authorizes or approves purchases in 6,000 producing plants. Ask about the new Quick Mail Inquiry System, included for the first time in the 1941 edition. Assures more traceable inquiries for your advertised products.

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The production records of prominent open pit mine operators reflect the profitable side of **MARION** performance. The many features built into **MARION** Three Motor Drive . . . Ward Leonard Control shovels and draglines, designed especially for open pit mining, account for their capacity to provide payloads every time in the toughest kind of digging . . . under the most strenuous of production shedules. Write for bulletin describing these **MARION** features in detail. » » » » »

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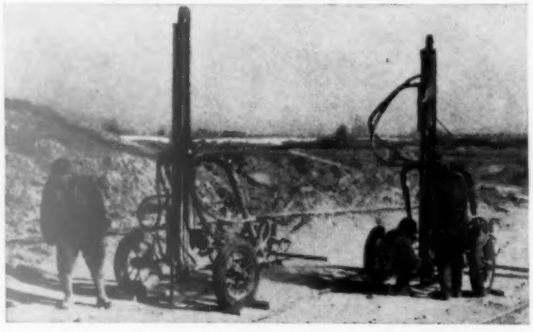
# *Here's the Answer* TO YOUR DIFFICULT DRILLING PROBLEMS

ROCK moves out faster—expenses go down when a Gardner-Denver Wagon Drill goes on the job. Our files are full of reports from users telling of savings due to the low air consumption and maintenance of Gardner-Denver Wagon Drills—savings that mean more profits.

These drills are built to take it; they work long hours on the toughest quarry jobs without requiring time out for repairs or adjustments. Users can prove that you get more footage—at lower cost—with Gardner-Denver Wagon Drills. Have you thought of cutting your costs with these drills? For complete information write Gardner-Denver Company, Quincy, Ill.



## 148,000 FEET OF HOLE DRILLED BY THREE GARDNER-DENVER UM DRILLS IN 62 DAYS

Performance like this is the usual result when Gardner-Denver UM Universal Mounting Rigs take over. The toughest job cannot lick these drills—they operate efficiently and economically in rough country where many moves are required.

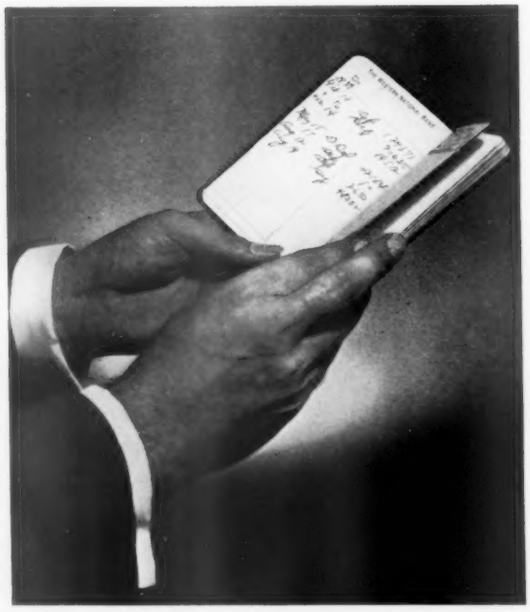
## HANDLE DIFFICULT DRILLING JOBS AT A PROFIT WITH GARDNER-DENVER WDS WAGON DRILLS

Deeper holes can be drilled easily and efficiently at difficult angles with Gardner-Denver WDS Wagon Drills. Ten-foot changes of steel can be handled for drilling in any position from 9° above the horizontal to vertical. Increase rock production in *your* quarry with these drills.

**GARDNER-DENVER**
*SINCE 1859*



# HERE'S WHERE



## YOU GET THE ANSWER

Go back to your bankbook . . . there is the story of any lime plant's success (or failure). And it's shown in two ways—the profit you're making now, and the **greater profit you could make** if your plant were modernized by **Lime & Hydrate Plants Co.** experts.

●

Our **York-Kuntz Continuous Lime Kiln** is making new profits for plants throughout the world. The acceptance of this **proved** system has come, not from words, but from **performance** . . . because the owners called on the **one** organization which knows the lime business best.

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So . . . think of **your** bankbook. Write us **now** . . . state your problem—and see how efficiently we find the proper answers. By calling on **Lime & Hydrate Plants Co.**, you tap the greatest storehouse of experience in the business . . . design, manufacture, erection, and operation.

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● 40 Years' Continuous Experience in the Lime & Hydrate Plants Industry.

# Producing Different Grades *from* ONE MILL

*From...* 60% MINUS 100-Mesh *to* 99.9% MINUS 325-Mesh

## *Speed* of Whizzer controls Fineness of Product

With higher specifications being demanded on many powdered materials, the Raymond double-whizzer type Roller Mill becomes more important than ever in controlling the finished product and reducing production costs.

The fineness can be varied while the mill is running simply by a turn of the whizzer speed control dial. This makes it possible to produce a wide range of different grades without changing the set-up or interrupting production. The whizzer separator permits free passage of the material, resulting in greatly increased capacities with record low tonnage costs. You can obtain both economy and quality with the Raymond Roller Mill in grinding limestone, gypsum, clay, chalk whiting, kaolin and many other nonmetallic minerals. Write for detailed information.

May be equipped with drying system for removing moisture while pulverizing.

SINCE 1887

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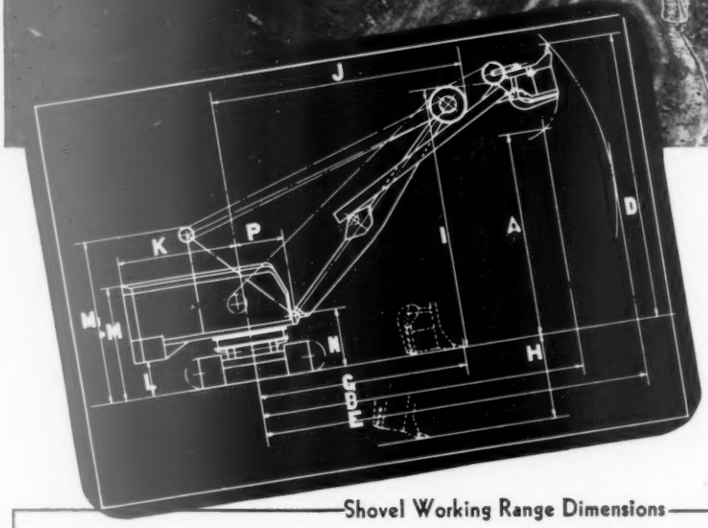
**COMBUSTION ENGINEERING COMPANY, INC.**
**1321 North Branch Street** CHICAGO
Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal




Newest in the Bucyrus-Erie family of champions, the 2½-yard 54-B electric is a machine offering real savings to quarry owners. Highly mobile for maximum usefulness throughout the pit, this 54-B can handle stripping, and do a real job on heavy-duty rock loading as well. Scientifically designed and built for the job it has to do, the 54-B is a balanced machine with a combination of speed and strength that means big production and low operating costs. It will more than pay its way in any pit.

*In addition to the electric machine, the 54-B is also available with diesel power. Choose either type of power, and you have a years ahead Bucyrus-Erie, the champion in its class.*

**Shovel Working Range Dimensions**

| | | |
|---|---|---|
| Dipper capacity | 2½ cu. yd. | |
| Length of boom | 28'-0" | |
| Length of dipper handle | 18'-0" | |
| Angle of boom | 45° | 50° |
| A — Dumping height — maximum | 19'-6" | 21'-6" |
| B — Dumping radius — at maximum height (A) | 31'-3" | 29'-9" |
| B1 — Dumping radius — maximum | 33-0" | 32'-3" |
| D — Cutting height — maximum | 29'-6" | 31'-9" |
| E — Cutting radius — maximum | 37'-6" | 36'-9" |
| G — Radius at level floor | 23'-3" | 22'-9" |
| H — Digging depth below grade — maximum | 9'-0" | 8'-3" |
| I — Clearance height — boom point sheave | 28'-0" | 29'-9" |
| J — Clearance radius — boom point sheave | 27'-0" | 25'-3" |
| K — Clearance radius of revolving frame | 13'-9" | |
| L — Clearance under frame to ground level | 4'-5" | |
| M — Clearance height — boom and A-frame lowered | 12'-3½" | |
| M1 — Height of A-frame | 17'-6" | |
| N — Height of boom foot above ground level | 6'-3½" | |
| P — Distance boom foot to center rotation | 5'-3" | |

**MACHINERY:**

| | |
|---|---|
| Hoist drum, pitch diameter | 31" |
| Diameter of boom point sheaves | 42" |
| Diameter of padlock sheave | 24" |
| Diameter of hoist rope — two part | 1⅛" |
| Diameter of boom suspension rope — 8 parts | ¾" |

**ELECTRICAL EQUIPMENT: (WARD-LEONARD)**

| | |
|---|---|
| M.G. Set driving motor (induction) | 125 H.P. |
| Hoist motor | 60 H.P., 230 volt, 75° C. Cont. |
| Swing motor | 23 H.P., 230 volt, 75° C. Cont. |
| Crowd motor | 23 H.P., 230 volt, 75° C. Cont. |

Generators for W. L. control are equivalent in capacity to their respective motors.

# Bucyrus·Erie

SOUTH MILWAUKEE, WISCONSIN



PRINT IN BIN

# SYMONS SHORT HEAD CONE CRUSHERS

USED THE WORLD OVER FOR CRUSHING MATERIAL *to the* MINUS HALF INCH SIZES

**NORDBERG MFG. CO.,** MILWAUKEE WISCONSIN

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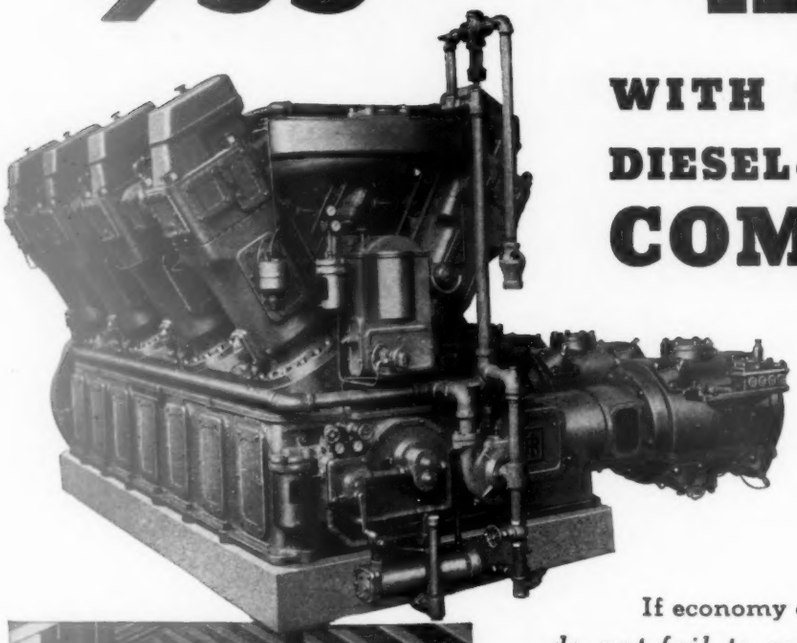
# 933 CU. FT. OF AIR FOR 1¢*

## WITH THE XVO DIESEL-ENGINE-DRIVEN COMPRESSOR



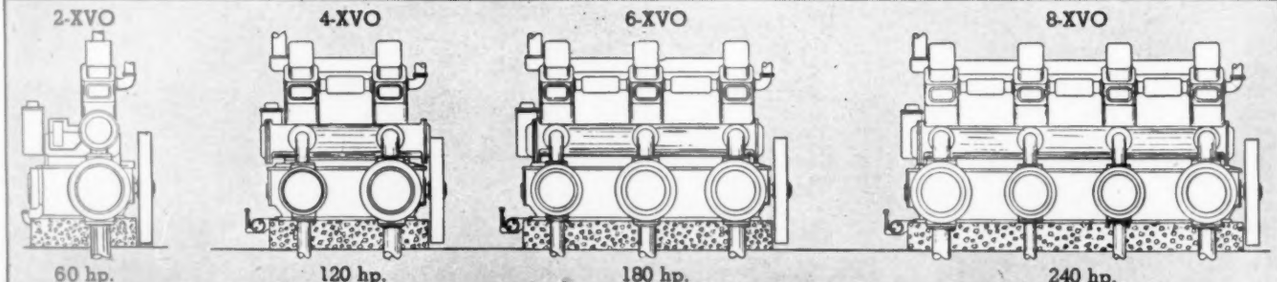
*1¢ worth of fuel oil (6¢ per gallon) compresses 933 cu. ft. of air to 100 lbs. pressure in the XVO.

*Two-stage 4-XVO furnishing air for tunnel work on the Pennsylvania Turnpike.*

If economy counts first in your compressor plant, *do not fail to consider the XVO.* It has a higher operating economy and a much lower upkeep cost than any other Diesel-engine-driven compressor ever produced by Ingersoll-Rand. Moreover, the XVO is built for twenty-four-hour, continuous service.

If your compressor requirements fall within the power range of the XVO, there is a combination of cylinders to give you a compact, efficient unit for any pressure or vacuum. Standard units for 100 lb. pressure are available in capacities of 312, 625, 935, 1250 cubic feet per minute actually delivered.

Call or write the nearest Ingersoll-Rand branch for more information on the savings that a Type XVO compressor can make for you.




The diagrams show standard cylinder and intercooler arrangements for two-stage 100-lb. compression with each size unit.

Atlanta, Birmingham, Boston, Buffalo, Butte, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Duluth, El Paso, Hartford, Houston, Kansas City, Knoxville, Los Angeles, Newark, New Orleans, New York, Philadelphia, Picher, Pittsburgh, Pottsville, Salt Lake City, San Francisco, Scranton, Seattle, St. Louis, St. Paul, Tulsa, Washington

**Ingersoll-Rand**

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# PIT AND QUARRY

Vol. 33 OCTOBER, 1940 No. 4

# CONTENTS

News of the Industry . . . . . 23
Editorial: Democracy in Danger—II . . . . . 28
Resettlement Project Workers Operate This West Virginia Crushing Plant . . . 29
Cement Official Urges U. S. A. Combat Nazi Fight for South-American Trade . . 31
Meeting Specification Requirements for Fine Sand and Crushed Gravel . . . 32
American Aggregates' New Columbus Plant 34
The Lubrication of Equipment—Part V. Screens 39
Pioneer Wisconsin Stone Firm Erects Mineral-Wool Plant . . . . . 42
Trucks Cut Intra-Plant Hauling Cost . . . 44
Belt-Conveyors Used Extensively at Long Island Sand-Processing Plant . . . 46
New Hot-Mixed Bituminized-Aggregate Plant Has Automatic Control System . . 51
Erects Model Cinder-Block Plant to Replace One Damaged by Hurricane . . . 67
Supplies Cinder Concrete for Floors and Roofs of Huge Apartment Project . . . 69
Florida Products Maker Enjoys Best Sales Year Since Collapse of Boom . . . . 71

Current Business Indicators . . . . . 27
Personal Mention . . . . . 53
Labor Decisions . . . . . 54
Traffic News Digest . . . . . 58
New Machinery and Supplies . . . . . 60

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## Marquette Takes Over Hawkeye Plant; to Make Improvements

The Marquette Cement Manufacturing Company has taken over the Des Moines plant and Earlham, Iowa quarry of the Hawkeye Portland Cement Company and will handle all production, while marketing will continue under the Hawkeye brand through a newly-organized concern headed by Bertrand E. Manley, formerly general manager of the Hawkeye Company.

The plant and quarry were opened by the old Iowa Portland Cement Company in 1910.

An immediate improvement and replacement program will be undertaken, said W. A. Wecker, president of Marquette, who declared:

"This plant possesses excellent raw material sources and all other essentials of a first-class cement operation. We contemplate utilization of waste-heat gases through modern steam generating facilities to produce the electric power to replace the obsolete equipment now in use.

"The quarry at Earlham will be fully equipped with modern Diesel trucks, power shovels and locomotives for shipping the overburden and removing rock. The product of the quarries will be handled entirely by new grinding equipment.

"When we get through, we will have a plant capable of maintaining its position in present day competition.

"Thus we believe the employes will be assured of year-round work and a feeling of security in their jobs which is hardly possible today."

## West Coast Producers Win Rate-Parity Case

Placing Southern California cement companies in a position to bid on an equal basis with Atlantic Coast concerns on Panama Canal contracts, the United States Maritime Commission in Washington has directed steamship lines operating between New York and the Canal Zone to cease giving preferential rates to the Atlantic Seaboard.

California Chambers of Commerce have been carrying on a battle to win an even break on Canal Zone business for Pacific Coast cement makers (PIT AND QUARRY, September, 1940, page 25) while the cement makers themselves recently enlisted the aid of California's Governor Olson to obtain rate parity with the East Coast.

## Coming Events

*October 7-11, 1940—Chicago.* Annual Safety Congress, National Safety Council, Stevens Hotel.

*October 10-11, 1940.—Washington.* Mid-year board meeting, National Sand & Gravel Association, Willard Hotel.

*January 15-17, 1941—Cincinnati.* Annual conventions, National Sand & Gravel Association and National Ready Mixed Concrete Association, Netherland-Plaza Hotel.

*January 20-22 1941—Cincinnati.* Annual convention, National Crushed Stone Association, Netherland-Plaza Hotel.

*January 27-31, 1941—New York.* Annual convention, American Road Builders' Association, Pennsylvania Hotel.

*February 10-12, 1941—Chicago.* Annual conventions, National Concrete Masonry Association and Cast Stone Institute, Hotel Sherman.

*February 18-20, 1941—Washington.* Annual convention, American Concrete Institute, Mayflower Hotel.

## Seeks to Dissolve Alleged Monopoly on Sand and Gravel

The Federal government is preparing a civil suit in District Court at Washington, D. C., for the dissolution of an alleged monopoly in the sand-and-gravel business at the nation's capital after a grand jury failed to return an indictment against the Smoot Sand & Gravel Corporation, on a government charge of being a "practical monopoly."

In a letter to Federal Works Administrator Carmody early in July, Assistant Attorney General Thurman Arnold, in charge of the Anti-Trust Division, wrote that the Smoot firm was a "practical monopoly" and that the firm constituted a "dangerous bottleneck which at any time may stop the entire building program in the city."

A strike at the Smoot firm was settled about July 13, when some 250 employes went to work and a 10 per cent. salary increase obtained.

## Build Dock to Serve New Explosives Plant

An unloading dock has been erected on the Ohio River at Utica, Indiana, for use jointly by the Ohio River Sand Company and the Louisville Sand & Gravel Company for transferring sand and gravel from barges to trucks.

The trucks will haul the material to Charlestown, Indiana, where the du Pont company is erecting a huge explosives plant to supply the national defense needs of the government.

## Completes Installation of Two Rotary Kilns

Basic Dolomite, Inc., has practically completed the installation of two additional kilns at its Maple Grove, Ohio, plant.

The refractory work was completed September 11 by Arnold & Son, the contractors, according to Charles Arnold.

## Gypsum Manufacturers Plead Innocence on Anti-Trust Charges

Patent licenses of the kind questioned in the U. S. Department of Justice's anti-trust suit against the National Gypsum Company and five other gypsum companies have been in existence for 100 years, President Melvin H. Baker of National Gypsum has asserted.

"The legality of contracts similar to those in the gypsum industry," Mr. Baker said, "was upheld in a decision by the late Chief Justice William Howard Taft of the U. S. Supreme Court in the General Electric case. The specific patent contracts now in effect were approved in 1929 by three United States District Courts, including the District Court in Buffalo."

"The Department of Justice," he declared, "apparently has developed a new interpretation of the anti-trust laws and expects to give the Supreme Court an opportunity to reverse the decision handed down by Chief Justice Taft. If it does, we shall, of course, abide by the decision.

"In making decisions for our business, we can only be guided by what the court has said the law was, and not by a guess for how these interpretations might later be changed by some particular administration."

The five gypsum companies filed pleas of innocence on September 20.

## F. F. Bartel Chosen as Research Fellow

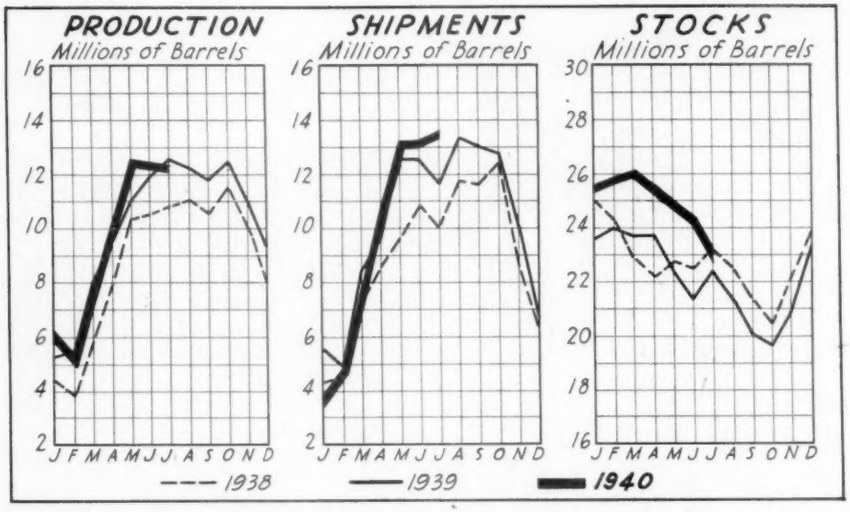
Following the recent establishment of the National Sand & Gravel Association's Research Fellowship at the University of Maryland, the association has now selected the Fellow from a group of about 20 applicants from schools in all sections of the country. He is Fred F. Bartel, a 1940 graduate in civil engineering from the University of Wisconsin.

Mr. Bartel had an excellent record at Wisconsin and comes highly recommended by members of the faculty. His graduate research work will deal with the general problem of the "effect of aggregates on the durability of concrete," with principal attention devoted to a consideration of gravels which are predominately chert.

## Gypsum Workers Win Silicosis Damages

Ignazio Ianni of Oakfield, New York, one of a score of gypsum-mill workers who have brought court actions against the United States Gypsum Company, has been awarded nearly $5,000 in compensation court and continuation of disability payments of $16 a week which were begun on June 15, 1933.

The plaintiff claimed permanent injury to his lungs as a result of breathing dust in the company's Oakfield plant.




The Portland-cement industry in July, 1940, produced 12,299,000 barrels, shipped 13,552,000 barrels from the mills, and had in stock at the end of the month 22,752,000 barrels of cement, according to the Bureau of Mines. Production in July, 1940, showed a decrease of 2.7 per cent. and shipments an increase of 15.3 per cent. as compared with July, 1939. Stocks at mills were 1.7 per cent. higher than a year ago. The mill value of shipments, 53,826,000 barrels, in the first half of 1940, is estimated as $79,659,000.

## Ottawa Silica Awards Power-Plant Contract

The Ottawa Silica Company, which operates three plants in the Ottawa area, has awarded contracts for the erection of a new 3,000-kilowatt generating plant to supply power to its operations.

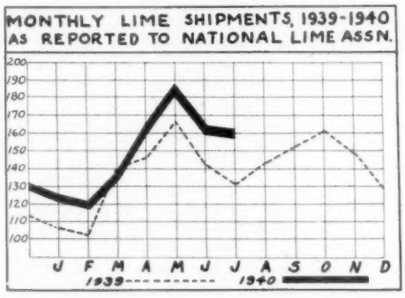
Equipment will be installed by the Allis-Chalmers Manufacturing Company and the General Electric Company. The plant is expected to be ready to operate by spring of next year.

The company has also applied to the War Department for permission to erect a loading dock on the Illinois River for shipment of sand to Chicago by barge.

## First Fatal Accident in 13-Year Period

An industrial-safety record which extended over the last 13 years during which time not a single fatal accident occurred ended August 29 for the Volunteer Portland Cement Company, Knoxville, Tennessee.

The victim was Paul A. Pratt, 25, who was engaged in excavating for a new bin structure. He was electrocuted in a pump-house where he had taken refuge during a rain storm. Resuscitation crews worked over him for more than an hour in vain.




According to data collected by the National Lime Association, 72 companies in July, 1940, shipped 158,017 tons (93,344 quicklime; 64,778 hydrate). Reporting companies represent 51.7 per cent. of the association's total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry the total shipments for the month are estimated to have been approximately 300,000 tons. Shipments of lime by use and grade for July, 1940, were:

| Use | Quick lime (tons) | Hydrate (tons) |
|---|---|---|
| Agricultural | 1,150 | 11,387 |
| Building | 19,243 | 34,472 |
| Chemical | 72,951 | 18,919 |
| Total | 93,344 | 64,778 |

**EMPLOYMENT AND PAY-ROLLS**

(Compiled for PIT AND QUARRY by Isador Lubin, Commissioner of Labor Statistics, U. S. Dept. of Labor.)

| Industry | Establishments | Number of Employees | Pay Rolls (1 week) |
|---|---|---|---|
| **Cement:** | | | |
| June, 1940 | 137 | 21,919 | $603,678 |
| July, 1940 | 137 | 21,799 | 591,219 |
| Percentage change | | —0.5 | —2.1 |
| ***Quarrying and non-metallic mining:** | | | |
| June, 1940 | 941 | 32,885 | 753,708 |
| July, 1940 | 941 | 32,846 | 744,201 |
| Percentage change | | —0.1 | —1.3 |

*Preliminary.

The Salem Sand & Gravel Company has added about $2,000 worth of new equipment to its plant in Salem, Oregon.

## Construction Awards Reach Highest Level Since June, 1930

Construction activity reached a ten-year peak in August. Not since June, 1930, have contracts awarded in the 37 eastern states exceeded last month's total of $414,941,000, according to the F. W. Dodge Corporation. The August total of residential building contracts, $152,988,000, was the highest since July, 1929, and exceeded the August, 1939, total by 20 per cent.

Construction undertaken under the national defense program was responsible for a large portion of the increased volume; it brought the total volume of public-construction contracts up to $195,293,000 compared with $158,459,000 in August of last year. However, private-construction contracts increased from $153,869.000 in August, 1939, to $219,648,000 last month, a 43-per cent rise. This $68,000,000 increase included a $29,000,000 increase in manufacturing building contracts ($10,369,000 in August, 1939; $39,586,000 in August, 1940) consisting in considerable degree of plant expansion stimulated by defense orders. However, there were also substantial increases in private commercial and residential building contracts.

Commenting on the August record, Thomas S. Holden, vice-president of the Dodge organization, said, "The impetus given to construction by the defense program has just begun to be felt, and some defense requirements have not yet been taken care of in appropriations made to date. It should be noted also that the figures given in this statement do not include a number of large defense projects on the West Coast and in colonial territories, both of which are furnishing an augmented market for materials and labor. Undoubtedly, total construction volume for 1940 will exceed by a substantial margin the estimates which were current at the beginning of this year."

## Building Materials in Extremely Heavy Demand

With many gypsum-board and insulation-board plants operating on a 24-hour day, seven-day week in an effort to fill available orders, leading building materials manufacturers are doing their biggest business in the history, trade observers report.

Army and industrial mobilization for defense is already beginning to heap some additional demand on the high level caused by an increased volume of domestic residential building, and there is no sign of slackening in the demand before seasonal factors begin to operate in November. Should the program for industrial expansion to provide munitions and war equipment be carried through as scheduled, it is likely that the seasonal contraction in demand late this Fall may be somewhat less than usual, these observers believe.

Demand for the product has built up to such a point that some board mills are running behind on their orders. Coming quickly to the front is the huge demand for various insulation and gypsum boards to be used on construction of barracks and quarters for the men who will be conscripted. Also a factor in the potential demand is the proposal to sharply expand aircraft factories and to build a string of munitions and arms plants across the country.

## Wins Partial Exemption from Maximum Hours

The Le Roy Lime & Crushed Stone Corporation at Le Roy, New York, has obtained a grant of partial exemption from the maximum hours provision of the Wages and Hours Act. The exemption permits workers to work up to 56 hours a week without overtime wages, but does not affect the minimum wage provisions of the act.

## Erect Two New Plants at Jeffersonville

Two new industries at Jeffersonville, Indiana now under construction are the crushed-stone plant of the T. J. Adkins Company with a daily capacity of 1,000 tons of crushed material, and the ready-mixed-concrete plant of W. R. Sostheim, who owns and operates the New Albany Ready Mixed Concrete Company of New Albany, Indiana.

## Errata

In the article, *Obsolescence in the Lime Industry,* by "Calx," on pages 30 and 43 of the August issue of PIT AND QUARRY appeared a typographical error, which in the interest of archaeological accuracy should be corrected. In the twelfth line of the second paragraph of the first column of page 30 the Palace of Knossus was incorrectly referred to as the "Palace of Ruossos." The error passed the watchful (?) eyes of two proof-readers.

In an article in the September, 1940, issue of PIT AND QUARRY describing the new plant of the Ohio Marble Company at Piqua, Ohio, mention was made of a "No. 6" Traylor Type TY crusher. All TY crushers are designated by the bottom diameter of the head which in this case is 3 feet—not by model numbers.

## Indicts Producers of Bentonite for Production Control

Members of an alleged trust controlling production of bentonite were indicted August 29 at New York in another phase of the Federal government's drive to smash manufacturing "blockades" in rearming.

The indictment was handed to Federal Judge Francis G. Caffey by a special Federal grand jury which has been considering defense "blockades" and price restrictions for the last month and a half.

The defendants, charged under the Sherman anti-trust act with conspiracy to control the production and sale of bentonite, included five corporations and eight individuals, as follows:

American Colloid Company of Chicago, and Paul Bechtner, its president.

Wyodak Chemical Company of Cleveland; Ralph Ditty, its president; Louis H. Heyl, general manager.

F. E. Schundler & Company of Joliet, Illinois, and F. E. Schundler, its president.

Whitehead Brothers Company of New York; Joseph A. Anglada, president; A. Y. Gregory, vice president.

Processing Corporation of America, New York, Joseph A. Anglada, president; Nelson Littell, patent attorney.

According to Samuel S. Isseks, assistant United States attorney general, the indictment represents a test case to determine whether vital strategic materials can be restricted merely by holding of processing patents.

The indictment charges that the Wyodak, Shundler, and American Colloid concerns are licensees under three patents relating to preparation of bentonite. They assertedly agreed with the other defendants, beginning in 1937, to obtain control of the production and sale of more than 90 per cent. of the bentonite produced in the United States.

## Blotting Paper Speeds Hardening of Concrete

An inexpensive method of hardening surfaces, according to the United States Reclamation Bureau engineers, is the use of "blotting paper." It compacts the concrete and prevents the formation of voids.

The blotting paper is in reality a highly absorbent fiber wall board. By unrolling it on the still soft concrete of dam spillways it draws out excess moisture and allows air bubbles to escape from the drying mixture. The concrete dries evenly, while the fiber board remains moist and protects the surface.

## Sees a Rejuvenated Lime Industry

By THERON C. TAYLER

"Pulverized Coal Firing of Rotary Lime Kilns" by "Calx" published in PIT AND QUARRY for September is an exceptional contribution to the development of *higher-capacity* and *more efficient* rotary kilns for the production of *better-quality* lime.

I have had some experience in the firing of a rotary lime kiln with petroleum coke, many different grades of coal and with fuel oil and wish to confirm "Calx's" statement regarding the relative merits of these fuels. It is quite generally agreed that natural gas is the ideal fuel. Petroleum coke might well be considered as next best with oil third and pulverized coal fourth. Petroleum coke may be too expensive at most plants, but considering its high heat value it was the least expensive at one plant.

Slag-ring formation is not eliminated by changing from coal to petroleum coke or oil as a fuel. Rings may not form as fast but they will form if there is a zone where the temperature is high enough to fuse the impurities in or on the limestone. The analysis of the slag ring will be about the same whether the fuel is coal or oil. The ring will be chiefly dead-burned lime fused because of impurities which need not come from the fuel. The best limestone will carry as much fusible impurities into the kiln as the best coal.

There is a national slogan, "Millions for defense but not one cent for tribute." Let us not pay tribute in the form of providing ways and means for ring removal, but let us invest in the only sure way to prevent ring formation—the control of maximum flame temperature.

Nothing could be more sound than the author's reference to the use of kiln exit gases for heating and drying the fuel and lengthening and softening the flame intensity. This is an application of the Eldred system to the rotary lime kiln, a field where it should be very effective. To be efficient the recirculated gases should be taken off and maintained at calcination temperature.

The fuel should be dried and heated to high temperature. There is no danger, because the returned $CO_2$ and much restricted air, supplied through the pulverizer, makes a mixture having a slow rate of flame propagation (non-explosive) and traveling at such speed toward the burner that any flame admitted to the pulverizer will pass through and leave the burner tip. Such a flame will not burn with intense heat close to the burner, hence the burner-maintenance cost is lowered.

How true the writer's statement, "The lime industry is undoubtedly entering a new era." We will soon see some real high-capacity and high-efficiency installations and they will include in some form most of the ideas presented in that article by "Calx" and a host of other ideas to which he alludes in these words, "the control and conservation of . . . temperature once generated is where we must look for those 16- to 20-per cent. coal-input stories which are being so widely discussed."

## Cement-Plant Strike Ends; Work Resumed

The strike of workers at the Prospect Hill and Sugar Creek plants of the Missouri Portland Cement Company, begun August 9 (*P & Q*, September, 1940, page 29), was terminated September 9.

On August 9 the hour-rate and piece-rate workers of the company, 275 at the Prospect Hill plant and 115 at the Sugar Creek plant, went on strike, necessitating the closing of the plants. The United Cement, Lime and Gypsum Workers' Union, Local Number 27, an American Federation of Labor affiliate, called out 84 of its members because of their refusal to work with nonunion men. There was no closed-shop agreement, but the company had written contracts with its workers in those classes covering all matters of employer-employee relationships. Signed on January 19, 1940, these agreements will expire on February 1, 1941. They contain a clause providing that "There shall be no interruption of the company's operations through any strikes or lockouts during the term of this agreement."

Although three representatives of the union declared that it was a violation of the contract between the company and the union to continue to work with nonunion employees, the company says that its agreements with its workers do not contain a union or closed-shop clause. Prior to their walk-out the company's employees were warned that strike action would be a violation of their agreements.

On August 29 the Independence division of the circuit court issued a temporary order restraining the 84 striking employees from interfering with the 15 employees who were not union members and desired to work. These men were escorted to and from work by deputy sheriffs.

The striking employees returned to work in accordance with schedules prepared for the orderly resumption of operations. Following the completion of certain repair work at the Sugar Creek plant the kiln was put in operation on September 16.

## Cornuelle Sponsors Housing Project

A medium-rent housing project to care for 90 families is to be erected in Covington, Kentucky, by Fred Cornuelle, president of the Ohio Gravel Company, Cincinnati.

The project will cost about $300,000. Mr. Cornuelle is now forming a company to finance the venture.

## Wallboard Ordered for Army Barracks

Two orders totalling 5,000,000 feet of wallboard have been received from the Federal government by the National Gypsum Company of Buffalo, it was announced by President Melvin H. Baker. The board will be used to rebuild soldiers' living quarters in training camps.

Operations in the company's 16 plants throughout the country, Mr. Baker said, "now are at the highest level in the concern's history, and are expected to continue at this rate until next Christmas." Employment in these plants, he said, has reached 4,500, also the best in history and 10 per cent. greater than last May. The upturn, he declared, has been caused by a general increase in public and private residential activity throughout the nation.

## Phosphate Rock Sales Show Small Increase

Midyear reports to the Bureau of Mines show that slightly more phosphate rock was shipped from American mines during the first half of 1940 than during the like period of the preceding year. Owing to loss of markets in Central Europe, shipments of Florida rock declined, but not enough to offset the increased tonnage shipped from Tennessee.

Total shipments from American mines rose to 1.766,732 long tons compared with 1,750,114 tons during the first six months of 1939, but the value was only $5,352,009 in 1940 as against $6,086,726. The reduction in average value to $3.03 from $3.48 a ton reflects the smaller proportion of export business which normally commands a higher price. Notwithstanding a reduction in Tennessee, total stocks in producers' hands increased, those in Florida being equivalent to more than 8 months supply at current rates of shipment.

# CURRENT BUSINESS INDICATORS

About $7,000,000,000 in contracts had been awarded by the Army and Navy by September 21 as part of the $15,000,000,000 defense program, according to a press statement of the Advisory Commission to the Council of National Defense. This sum is particularly significant as $5.000,000,000 of the total appropriation had been made available only a few days previously. Defense officials have cautioned that the wide interval between letting of contracts and actual deliveries must always be kept clear. Some contracts already awarded are held by firms who as yet have nothing else. Plants have to be built, tools and equipment procured, and labor trained before commercial-scale output is possible. Although defense spending already is reflected in business indicators, the full impact of the program will come later, possibly during the first quarter of 1941.

Steel production rose further in August and for the month as a whole mills operated at 90 per cent. of capacity. Except for a temporary drop over Labor Day the rate continued even higher in September, reaching 93 per cent. in the third week of the month. *Iron Age* reported recently that well informed individuals in close touch with the steel industry believe that at least two years of near-maximum activity are in prospect. There is talk, too, of a steel shortage but whether or not this becomes acute depends to a considerable extent on the fate of Britain, for the British are still buying heavily.

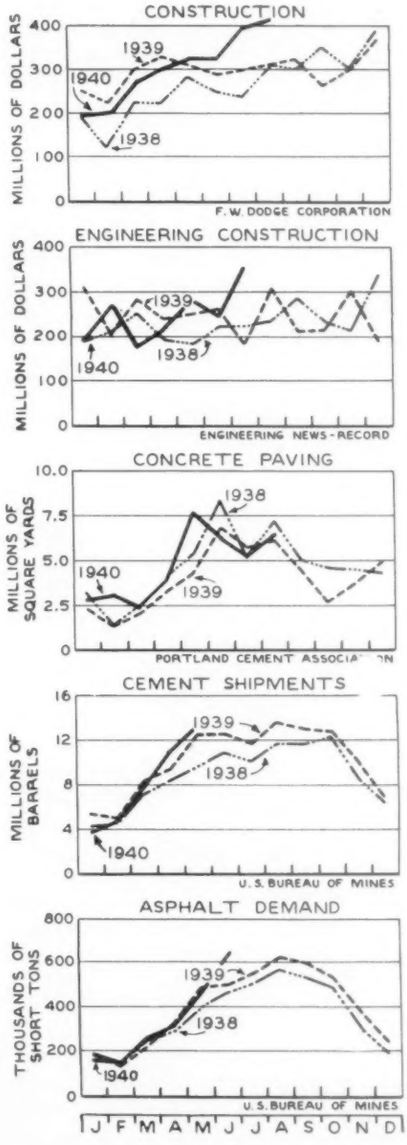
With airplane, ship, and ordnance items comprising the larger part of all defense orders the entire metal-working industry is preparing to handle an avalanche of business that is expected to result in the busiest year in history. The biggest gain, of course, is in the machine-tool industry.

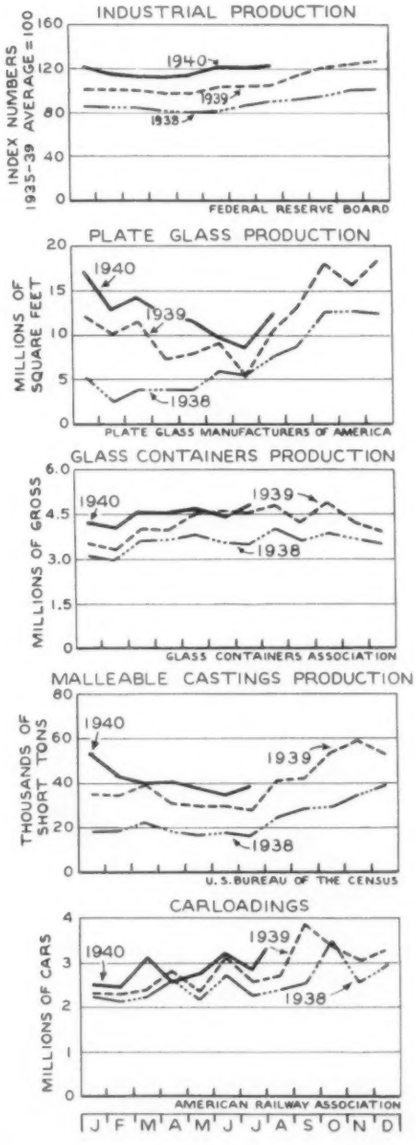
Talk of greatly increased industrial facilities, defense housing, barracks for 1,200,000 conscriptees, and coastal-defense construction indicates the demand for building materials, and some concern has been expressed about supplies of certain items. No definite data as to actual requirements are available, however, and as yet there has not been anything sensational in the way of a building boom, although the F. W. Dodge figure on contracts awarded in August exceeded $400,000,000 for the first month since the spring of 1930. Total awards for eight months of 1940 are only 5 per cent. above 1939, but it is likely that the last four months may be relatively higher.

Further evidence that building may soon take a prominent place in the defense program along with the steel, aircraft, and machine-tool industries is shown by the latest weekly report on construction contracts. Of a total of $120,809,000 about $45,000,000 was for military housing and with the conscription legislation now in effect construction of barracks and other related structures is expected to approach boom proportions. For seven months of 1940 engineering construction has been almost exactly equal to that of 1939. Concrete-paving contracts for eight months exceeded 1939 by 14 per cent. Portland-cement shipments for eight months and asphalt demand for seven months were 2 and 7 per cent., respectively, above the figures for 1939.

Indicators of demand for other nonmetallic-mineral products in general show even greater increases. The effect of the steel boom on the demand for fluxing stone, refractories, and fluorspar is obvious. Malleable-castings production for seven months was 24 per cent. higher than in 1939, suggesting near-peak output of foundry and blast sands. Glass-sand producers must also be relatively active for glass-containers and plate-glass output were up 9 and 32 per cent., respectively.

Freight-car loadings, a reliable barometer of business, were 10 per cent. above those of 1939 in the first eight months. Industrial production, as measured by the newly-revised index of the Federal Reserve Board, so far is 16 per cent. above that of last year.



# EDITORIAL

## *Democracy in Danger—II*

"OUR strategy is to destroy the enemy from within, to conquer him through himself." So spoke Adolf Hitler in 1932 to Herman Rauschning, ex-president of the Danzig senate and former member of the inner circles of the National Socialist party. Since that time the world has seen numerous examples of the results of the policy of dividing and conquering. Wherever democracy has stood as a barrier to the ambition of this man and his dupes it has been subjected to the attacks of a system of propaganda more penetrating, more pervasive, more pernicious than that of any other political entity.

Most people pride themselves on their highly developed intelligence, on their discernment, their sense of justice. It is an insult to their independence of judgment, they feel, if one so much as suggests that they could be influenced by the appeals of falsehood in seductive garb. Their levelheadedness, they like to believe, is an invulnerable bulwark against the assaults of untruth in any form. Propaganda is something, they would say, that it aimed only at the lower levels of intelligence and, in any event, could affect only "the other fellow." This is one of the manifestations of the intellectual isolationism of which we have written before.

Where, you may ask, could one possibly find in literate, contented, freedom-loving America anyone who would lend himself, even unwittingly, to the spreading of doctrines inimical to the perpetuation of our liberties? Who could be so *naive,* so base or so much in need as to make the dissemination of destructive misinformation either a political crusade, a vocation, or a pastime? But those who plot the annihilation of democratic principles are not so dubious. "We shall find such men, we shall find them in every country. We shall not need to bribe them. They will come of their own accord. Ambition and delusion, party squabbles and self-seeking arrogance will drive them," said Hitler to Rauschning.

And he has found them. Through such publications as *The Free American, The Daily Worker, Social Justice, Facts in Review,* and *The Defender* Americans and foreigners attack the institutions which we value above all else. Our belief in freedom of the press greatly facilitates the spread of their noxious doctrines. Through organizations such as the Ku Klux Klan, the Deutscher-Amerikaner Bund, the Defenders of Christian Civilization, the Kyfferhauser Bund and others men assemble and plan the undermining of a political structure which we believe assures mankind the maximum of happiness and opportunity. Without our belief in freedom of assembly such bodies could not openly organize for subversion. Through the distribution of pamphlets privately printed and through newspapers and magazines, through public platforms, the radio, the telegraph and telephone, chain letters and the like the enemies of democracy spread their false "facts" and illogical "reasoning" widely among us.

EQUALITY of opportunity and equal treatment regardless of race, color or previous condition of servitude are foundational in our political philosophy. Yet all the channels through which thought travels are being utilized to undermine that belief, to spread distrust among American citizens. The enemies of the democratic ideology know that it can not live in an atmosphere where men are turned against men, husbands against wives, parents against children by the preaching of race prejudice. Yet, closely paralleling the preachments of Nazi party leaders, are the words of men in our own country, men in public life, in positions of prominence in industry, in the pulpits of religion.

"Anti-Semitic propaganda in all countries is an almost indispensable medium for the extension of our political campaign. You will see how little time we shall need in order to upset the ideas and the criteria of the whole world, simply and purely by attacking Judaism," writes Rauschning quoting Hitler. Much more to the same effect has emanated from the loud speakers tuned to certain "religious" Sunday broadcasts. In the same vein spoke a priest of religion at a Fourth of July celebration in Queens, when he said that the liberty and equality pledge in the Declaration of Independence was "for Christians only."

National Socialist leaders in Europe talk of their desire for peace, and in America we have ardent advocates of a policy of appeasement, some of them men who have received the Order of the German Eagle as "distinguished foreigners who have deserved well of the Reich." Some men are flattered by the bestowal of such marks of distinction and perhaps should not be blamed if such recognition unsettles their previously sound judgment and induces them to advise courses of action that aid rather than counteract the plans of those who seek the end of democracy here as well as elsewhere.

IT IS easy to become hysterical; to see in every person of foreign birth or extraction an enemy of democracy, a foe of America; to try to read into every article and every speech an intent that is not there; to become suspicious of everyone who voices a contrary opinion. It is just as easy to remain indifferent, to close one's eyes, to place one's confidence wrongly. A sensible attitude is one of caution. fortified by facts, manifested by tolerant understanding, and supported by independent thinking.

It is easy, too, to exaggerate. It is easy to make too much of little things, yet our personal experiences of the last few years, multiplied many times by little incidents of the last twelve months, provide examples of dangers too great to be overlooked, too similar to be unconnected, too shocking to be unimportant. Over our desk have passed dozens of pieces of propaganda designed to shake our faith in democracy; to our home still come German propaganda-publications sent by "friends" who would like to win our good opinion and support for their cause; our radio brings in by both long and short waves arguments designed to make us indifferent to national defense, to make us trustful of, and even thankful for, the men who speak of "snivelling democracies" and call the government of America "the last disgusting death-rattle of a corrupt and outworn system."

This is the sort of division before conquest that is the aim of the present revolution in world politics. It is designed to pave the way for that collapse and dissolution which democracy's enemies so confidently await. "America is permanently on the brink of revolution," said Hitler to Rauschning at another time. "It will be a simple matter for me to produce unrest and revolts in the United States, so that these gentry will have their hands full with their own affairs."

To guard against such an eventuality we need all the calm, all the patience, all the determination to think clearly and to appraise accurately, all the power of discriminating judgment we can muster, and all the facts that painstaking investigation can reveal. We must not be too proud or complacent to recognize and accept the truth, nor too willing to believe the false and the fantastic.

# Resettlement Project Workers Operate This West Virginia Crushing Plant

This view of the Tygart Valley Association plant shows the main conveyor and the return conveyor at left. Cyclone dust-collector is also shown.

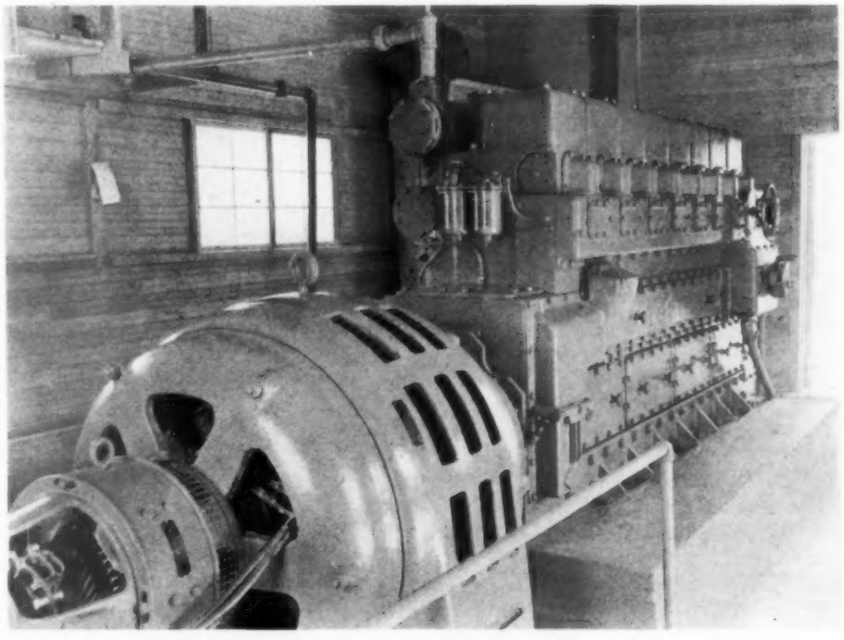
THERE are many plants in this country operated by various types of coöperatives for the purpose of supplying agricultural limestone at low cost to farmers in these areas. Some of these plants have failed, others have achieved their purpose in varying degrees, and still others have been forced into direct competition with existing commercial plants in order to survive. A plant which belongs in the last-named category is operated by the Tygart Valley Association near Dailey, a few miles south of Elkins, West Virginia, in the foothills of the Appalachian Mountains. Built originally to supply agstone for a farm settlement project this plant now sells most of its output. Only homesteaders are employed and they are paid prevailing wages. The product is sold at current market prices in competition with commercial producers without preference even on government work.

The history of this project is interesting enough to justify its description. It all began in 1933 when the Society of Friends (Quakers) started a true self-help coöperative without outside assistance to provide a livelihood for people stranded in a worked-out lumbering section. Five years ago the Resettlement Administration became interested and took over this project. Houses were built on 1½-acre plots and a large farm was worked coöperatively. Later control of this project reverted to the Farm Security Administration of the Department of Agriculture. On the project there are now 200 houses, of which 160 are occupied by homesteaders and the others by persons connected with the project. Within the last two years the farms have been sub-let to the homesteaders, and the association which was formed now operates independently on a long-term government loan. J. W. Bergthold is manager of the association.

Because the farms were not sufficiently productive and did not provide sufficient employment, several industries were started, the most important of which was a dimension lumber mill. Logs are made into furniture parts which are sold to manufacturers. Stores, a water-supply system and numerous small industries also provide employment.

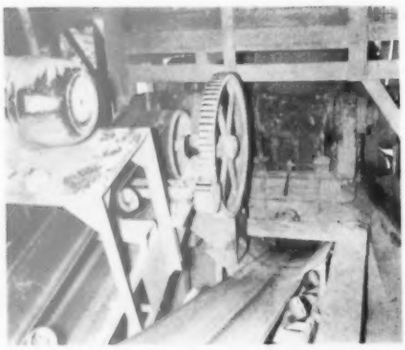
Investigations had proved that the soil lacked certain chemical properties, and that with the addition of agricultural limestone it could be made much more productive. This resulted in the decision to build the plant, which went into operation in April, 1937. Although designed primarily to produce agricultural limestone, provisions were also made for the production of various sizes of crushed stone. This turned out to be a wise move in the light of later developments. Now most of the plant's output is crushed stone, even during the agricultural limestone season. The plant was designed by the Diamond Iron Works, Inc., which also supplied most of the equipment.

The deposit is a good grade of limestone which has an average calcium carbonate content of 86 per cent. and passes state specifications for concrete



The 300-horsepower Diesel engine which operates the entire plant. The alternator is in foreground.

Lift truck raising a loaded bucket of stone for haulage to the plant.



The jaw primary crusher with main conveyor and return conveyor from reduction crushers.

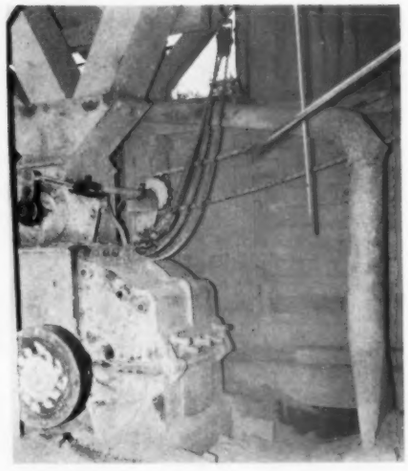
The 36- by 20-inch reduction roll-crusher with its plate feeder above.

aggregate. Two Gardner-Denver air-drills are used, air for these being supplied by a radial-type 6-cylinder Gardner-Denver compressor driven by a 75-horsepower Westinghouse motor. A Gardner-Denver drill sharpener is also used.

Stone is loaded by hand into 1½-cubic yard Lambert skip buckets of which ten are used. Two Ford trucks with Lambert hydraulic lifts haul the loaded buckets to the plant, where the stone is dumped into a 35-ton steel-reinforced wooden hopper. A plate-feeder carries the stone to the 15- by 36-inch Diamond jaw crusher. The crushed stone, usually minus 2-inch, is carried on the 24-inch by 200-foot belt-conveyor to the top of the plant. Thermoid conveyor belting is used on all conveyors.

The 4- by 8-foot, 3-deck Diamond primary vibrating screen is usually equipped with 4-, 2½-, and 1-inch wire cloth. The three sizes of stone passing over these decks go to three of the six 40-ton compartments of the wooden storage bin, which also has four 80-ton compartments. Material passing through the bottom deck of this screen goes to a second Diamond 4- by 8-foot, 3-deck screen. This is usually equipped with ¼-inch, No. 5 and No. 12 wire cloth. The three retained sizes are discharged to other 40-ton bin compartments and the material passing through the bottom deck goes on a 16-inch by 40-foot distributing belt conveyor into any of the four 80-ton compartments as finished agricultural limestone.

For the production of additional agricultural limestone material from 1-inch down can be fed from storage into a Williams hammermill under the bins. Any of the larger sizes of stone can be fed into a 36- by 20-inch Diamond roller-bearing roll-crusher. The roll-crusher has a plate-feeder and the hammermill a ratchet-operated rotary feeder. Products of both crushers are discharged on an 18-inch by 100-foot belt-conveyor which feeds back on the main conveyor to the screens. This arrangement makes it possible to convert all, or any part of the stone into agstone.



The hammer-mill used for fine reduction with its ratchet-operated feeder above.

One of the two 4- by 8-foot, 3-deck vibrating screens with dust-collector connections.

The plant has a capacity of about 330 tons of all sizes in an 8-hour day. When making only aggregates the capacity is over 50 tons per hour. When the entire output is agstone, the capacity is about 20 tons per hour. When No. 7 stone (1- to ⅜-inch) is the chief product, all the stone under ⅜ inch is reduced to agstone. The hourly capacity then is 28 tons of No. 7 stone and 10 tons of agstone. Base stone up to 4 inches is made, but most of the demand is for the smaller sizes of road and concrete stone.

The agstone averages 100 per cent. through 10-mesh, 56 per cent. through 60-mesh and 20 per cent. through 100-mesh screens. Stone sand is also made for state concrete work. Specifications limit this material to sizes between 4- and 50-mesh with not over 5 per cent. through 100-mesh and no difficulty is experienced in producing it.

Originally the plant operated on purchased power but the high stand-by or demand load charge during slack seasons made this too costly. Early in June of this year the installation of a Diesel-generating system was completed. The 300-horsepower Fairbanks-Morse 8-cylinder Diesel engine is of the latest type and is connected to a Fairbanks-Morse 312 kv.-a., 440-volt alternator. The engine is equipped with an Air-Maze air filter and two De Luxe oil filters. A small Fairbanks-Morse gasoline engine operates a compressor which supplies air for starting. This system is supplying 109 kw.-hr. on 35 gallons of fuel oil. The entire plant is operated a full 8-hour day on less than 100 gallons of fuel oil.

General Electric motors are used throughout the plant and all are dust-proof except the 150-horsepower motor driving the hammer-mill. This motor is located in a separate dust-proof building. Operations are controlled from a cabinet-type switchboard with a voltage regulator, selective heat indicator, etc. The electric motors total 427½ horsepower which is considerably more than the actual load at any time.

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## Installs New Kiln

Improvements to cost about $175,000 are reported to be in progress at the Cement City, Michigan plant of the Consolidated Cement Corporation.

The two 175-foot kilns are being replaced by one 405 feet long and new slurry tanks are being erected.

# Cement Official Urges U.S.A. Combat Nazi Fight for South-American Trade

By MELVILLE M. SMITH
President, La Cemento Nacional, C.A.
Guyaquil, Ecuador

I WAS very much interested in your editorial in the August PIT AND QUARRY and I want to congratulate you on it. We Americans who are in business abroad are considerably worried over the coming economic war of which one reads so much in the American papers and magazines and in books such as you mention in your editorial. While the United States government seems to be fully alive to the situation and is strengthening its legations and consulates in countries like Ecuador, I can not see that American business seems to be doing anything really constructive in the South American countries with which I am in touch.

In the legation in Quito and the consulates in Guayaquil and Quito there are no fewer than nine active and well-trained Americans, who all seem to be very busy handling the business that comes before them. In other words, these Americans are in the front-line trenches and can be depended upon to do their full share in repelling the coming economic war. But it seems to me that American exporters who will be affected directly in this future economic war should at least approach the United States government's efforts by having in Ecuador and other South American countries active, well-trained 100-per cent. Americans to represent them.

American companies sell their products in Ecuador through agencies. I do not know of a single American in Ecuador who is representing directly, and is on the pay-roll of, any United States exporting company. I do not believe that agencies will be of great value to United States business when the economic war starts. The Ecuadorian business man is going to buy where he considers it is most profitable for him to buy. He can not be blamed for buying from the Germans, if their conditions, considered from every point, are better than those of the American concerns. And I would not be at all surprised if agencies handling American products will also turn to Germany, if conditions warrant.

I would like to see Americans pushing American goods down here. A half-dozen non-competing American companies could get together on the expenses of such a man. He would work with the agencies representing the companies and keep in close touch with both the agents and the clients of the agent. A number of American exporting companies have offices in Lima. About once a year a very live and active young American in charge of one of these offices in Lima visits me. This company has an agent in Guayaquil, but this agent, a very pleasant Ecuadorian friend of mine, never visits me except with the American from Lima. I have given the American several nice orders which otherwise would have gone to other companies in the States.

Our cement company is one of eight non-competing associated companies here in Ecuador; we are all under separate management but maintain a joint office in the Wall Street district in New York, where there is a staff of five, two men and three women. The cost of maintaining this office is divided among the eight companies here in Ecuador, depending on the extent to which each company uses the central office. Our cement company purchases over $50,000 worth of spare parts, new machinery, supplies, etc., in the States every year.

I do not believe that half a dozen Americans in a year visit me in my office here. Before the war there were some months when two or three keen, highly-trained Germans would call on me. There are six or seven German sales engineers and experts in Guayaquil alone, representing directly large German exporting companies.

Ecuador is very friendly to Americans and American products. The last figures I have for Ecuadorian export trade cover 1936, when Ecuador exported $13,908,000 worth of products and imported $11,191,000 worth of goods. Of this amount the United States supplied Ecuador with $3,226,000 worth of material and purchased from Ecuador $6,392,000. So, of the 25 million dollars worth of Ecuador's foreign trade, the United States supplied 10 million dollars in round numbers, or 40 per cent. The interesting thing about Ecuador's foreign trade is that practically none of the products that Ecuador exports compete with United States products and about everything which Ecuador buys can be supplied by the United States.

Another thing which we American business men located abroad can not understand is why the United States exporters can not meet the Germans in the matter of the all-important question of credit terms. We fully appreciate the fact that this question has been brought before our people in the States for many years but apparently no solution has been found. There must be a lack of credit information in the States on successful operating companies abroad.

Our cement company generally pays cash for material which it purchases in the States, although our credit position is good with the companies from whom we generally purchase our main requirements. Almost invariably, however, when we write to concerns in the States, other than those with whom we do business, for prices, terms of payment, etc., the reply is that the terms of payment are cash with order or cash against bill of lading. Very often the sales manager in the States advises us that the conditions in Ecuador are such that credit can not be granted. Our cement company is managed by Americans, and, as we fully appreciate the bungling method of handling United States foreign trade, we pay cash.

But how about the successful Ecuadorian business man who is in the market for machinery and receives such terms of credit as mentioned above? He is likely to purchase from some

(*Continued on page 33*)

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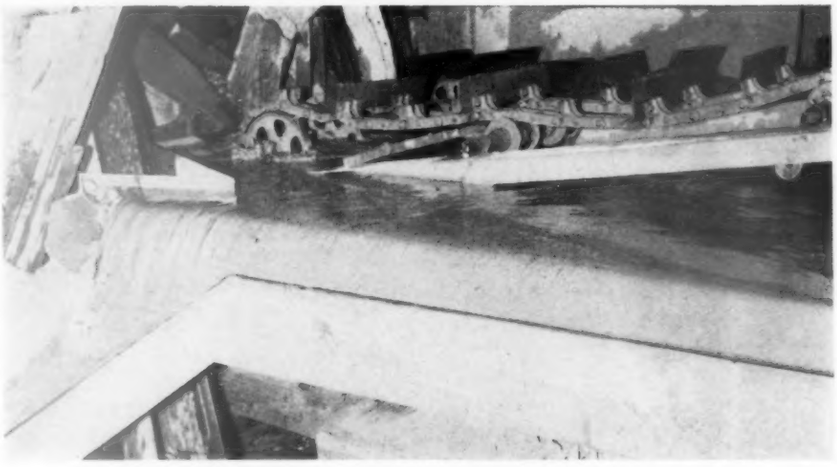
**The suggestions offered by the writer of this "letter to the editor," although of greatest importance to machinery manufacturers—such, for example, as those who furnish equipment to the nonmetallic-mineral industries—should be of almost equal interest to the producers in those industries themselves, since America's foreign trade is so important to her economic well-being. In past years our exports have provided a large share of our national income; in fact, the decrease which occurred in our exports in recent years has been held by some economists to be largely responsible for the difference between American prosperity and depression.—EDITOR.**

# Meeting Specification Requirements for Fine Sand and Crushed Gravel



The overflow from the dual drag tank which was built to retain 100-mesh sand.

CHANGING specifications have always been among the chief worries of aggregate producers. During the past year or two there have been two trends along this line which have caused many sand and gravel producers to remodel their plants. One of these trends is the demand for gravel with various percentages of crushed material which has been growing from year to year. A more recent development is the growing demand for sand with a specified minimum of minus 100-mesh material.

Several recent articles in PIT AND QUARRY have described measures taken by operators of large plants to meet these demands. This article describes the simple but effective manner in which the Price Brothers Company of Dayton, Ohio, solved this problem in its comparatively small plant. This plant is located in Dayton and has a capacity of about 90 tons per hour.

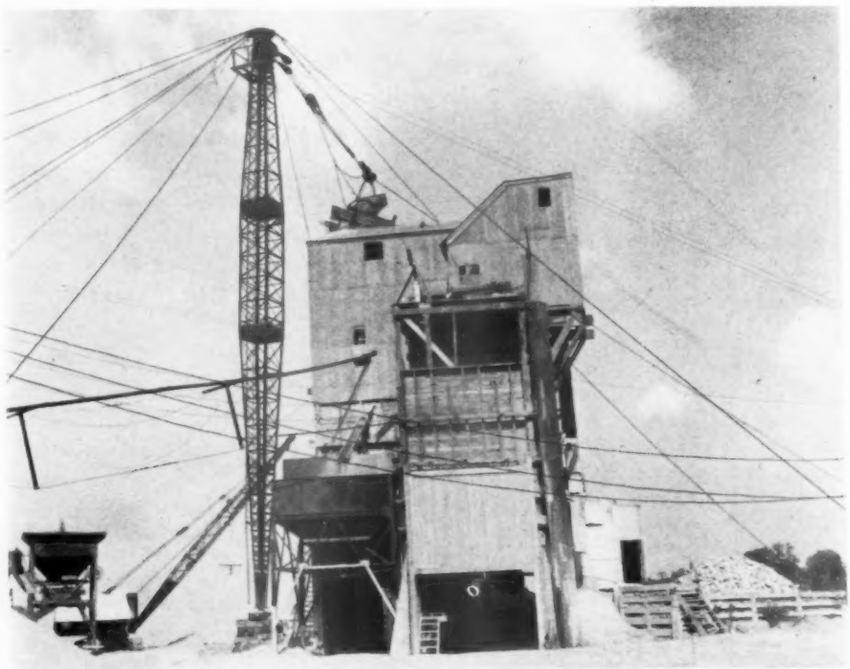
In Dayton and other Ohio cities the sand problem is an acute one because two important purchasing bodies include this requirement in their specifications. Part of the material purchased by or for federal government work must contain not less than 3 per cent. of minus 100-mesh material. The state highway department in March, 1939 brought out a new specification which was not made completely effective until March, 1940 in order to give producers time to conform to it. This specification requires a minimum of 2 per cent. passing 100-mesh.

The concrete sand now produced by this plant meets these specifications. It is interesting to note that the percentage of material passing the 50-mesh screen has increased almost exactly the same amount as that passing the 100-mesh. As the deposit contains only enough sand to meet demands for concrete sand no attempt is being made to produce masons' sand.

Material is excavated from the deposit by means of a Sauerman slackline cableway excavator with a 1½-cubic yard bucket operating on a span of about 700 feet. A new Caterpillar D13,000 Diesel engine was recently installed to operate the cableway hoist. The excavated material is discharged over a 4-inch sloping-rail grizzly, all the oversize sliding off on a pile. Material passing through the grizzly is flumed from the 6-ton steel hopper into a 5- by 10-foot revolving scrubber to which is attached a 6-foot long screen section. Screen openings are varied to meet demand but a 2-inch round opening is most commonly used. Gravel passing over this screen goes to a new 9- by 36-inch Universal Crusher Company jaw crusher of streamlined design. The crushed gravel can be discharged into a crusher surge bin or to a bucket elevator to be fed back into the scrubber for combination with the uncrushed gravel.

The minus 2-inch material passing through the screen goes to a 4- by 8-foot 3-deck vibrating screen which makes three finished sizes of gravel. These are discharged through chutes into bins.

The minus 3/16-inch sand passing through the bottom deck flows into a sand tank of the company's own design which was developed to catch the minus 100-mesh sand which overflows ordinary equipment. This tank was made from the two 16-foot Morrow sand tanks formerly used for this purpose without moving them from their original locations. The object was to



The Price Brothers' plant with bucket discharging a load. The crushers and elevator are at right. Trussed pipe flume is at left.

The impact crusher used for fine reduction with feed chute above.

increase the settling area and decrease the speed of water flow in the tank. This was done by removing both sides of both tanks and installing sides flaring out 45 degrees together with the required extensions of the front and back plates. The original drags were also lengthened 3 feet and the water depth was increased to 3 feet. In order to avoid disturbance of the water by the return flights of the drags, a pair of angle irons was installed lengthwise over each drag. The head and tail sprockets are mounted on these angle irons, with intermediate pulleys to support the flight.

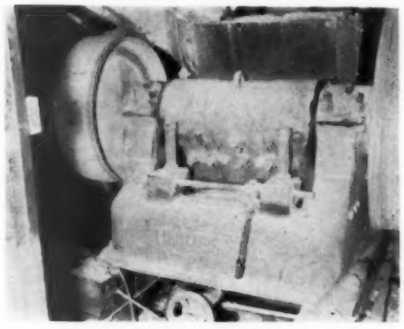
Sand is fed with 1.000 gallons of water per minute into this tank through an inlet flume opening along one side and waste water overflows a weir on the opposite side. Sand is produced at the rate of 25 tons per hour and is discharged through two chutes which have flop gates so arranged that they can feed into any of four bin compartments. This makes it possible for some of the bins to drain while withdrawing from others. Any surplus of sand can be flumed

The discharge end of the dual drag tank showing selective chutes.

to stock-piles through a 100-foot span of pipe braced with a steel-rod truss. This pipe can be moved within a 90-degree range by a crane. The 1¼-cubic yard Industrial Brownhoist crane also feeds sand and two sizes of gravel into a Heltzel batch bin. A Barber-Greene loader is used for truck shipments from the stock-piles.

Waste water from the sand tank and the screens flows through a rubber-lined flume to a standpipe under which is a concrete catch-basin. An underground pipe carries it off into a worked-out section of the pound.

Crushed gravel can be discharged from the surge bin previously described



The 9- by 36-inch streamlined jaw crusher which reduces oversize gravel.

into a Greenville roll-crusher or a new 20-inch Greenville impact crusher. Feed to the roll-crusher is controlled by a Greenville belt-feeder. The impact crusher is fed through a gate 5-feet above it and the material drops that distance through a 4- by 20-inch chute to obtain the required velocity for best results with this type of crusher. Material can also be fed direct to these crushers from the ¾-, 1½-inch, and pebble bins. The impact crusher can make 100 per cent. crushed ½-inch chips from ¾-inch gravel.

Products of both reduction crushers are discharged to a 62-foot bucket-elevator which feeds a 3- by 6-foot Deister Plat-O 3-deck screen. The two sizes of crushed gravel are discharged from this screen into four bins.

The Price Brothers Company has a rather unusual background. Originally starting out many years ago in the contracting and dredging business this company has become a leader in this field. While contracting is still its main line, it has added other fields from time to time. These include sand-and-gravel production and the manufacture of "Flexicore" reinforced-concrete slabs, concrete pipe and other concrete products. The sand-and-gravel plant was purchased in 1936 from the original owner. Harry S. Price, Jr., is manager of the sand-and-gravel end of the business and supervised the improvements recently made.

## South America

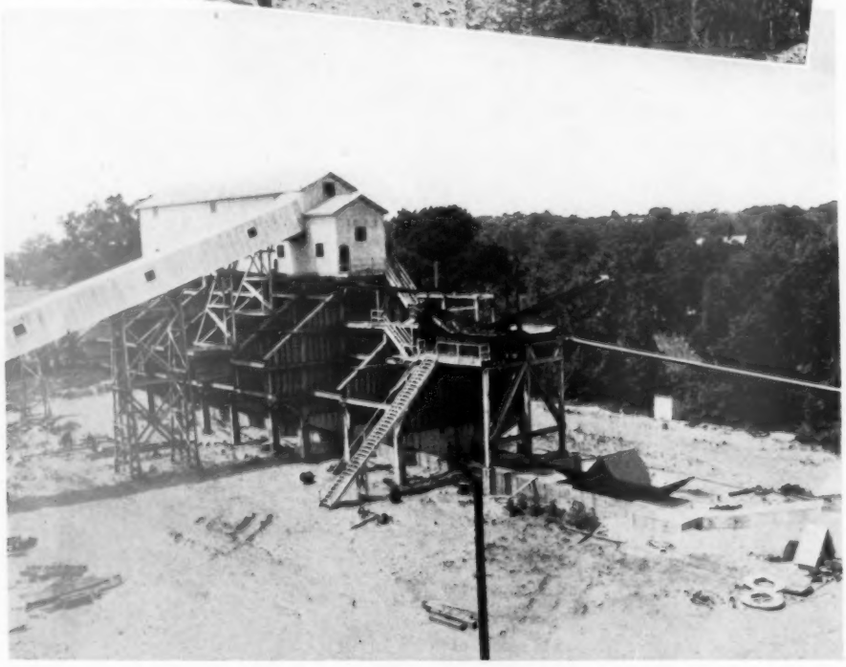
(from page 31)

other country which also makes the article he requires. This may be one reason why Ecuador purchased from the United States 48.4 per cent. of her imports in 1927 and only 28.8 per cent. in 1936 and why Ecuador purchased 11.7 per cent. of her imports from Germany in 1927 and 21.3 per cent. in 1936.

We have been making cement in Ecuador for five years and our product is sold in all parts of the country. We have no difficulty in disposing of the output of our factory. During the time we have been in business here we have marked off as uncollectable less than 0.1 per cent. of our total sales.

I have lived abroad for 28 years, of which 13 years were spent in Europe, 12 years in South America and 3 years in Canada. I am a chemical engineer and a graduate of a mid-western university. My legal home is not far from Chicago. I make frequent trips to the States in order to freshen up and keep in touch with the progress being made in my specialty, the making of Portland cement. During all the time I have been located abroad there were only four years in which I was directly connected with an American company interested in foreign trade. None of the cement plants I have put up abroad have had any connection with any cement company in the States, but practically all the machinery for five of the six plants came from the States.

I have before me the names of the men making up the Foreign Commerce Department Committee 1938-1939 of the Chamber of Commerce of the United States—a very imposing list of successful American business men. I am sure that this committee, or its successor, and the members of the Export Trade Association, the foreign sales managers, can hold their own with German business men interested in foreign trade when the economic war gets under way. But this war will not be finally won in New York, Washington, Chicago, or in Berlin, Hamburg, or Munich. It will be won or lost in the front-line trenches of battle. Germany is sending capable men to the different countries in South and Central America. I sincerely hope that our American business men do not put off too long the sending abroad of the same type of men that Germany is getting on the job. The best available men, from the standpoint of education and experience, should be sent; if possible, men who speak Spanish. They should not be men who have been failures in the States. I am sure that the fullest cooperation will be given by American business men located abroad, and by American government officials.



Top: The new Columbus plant near completion with settling basin in foreground. Center: The 4-cubic yard drag-line loading the movable car-loading hopper. Bottom: The main building with concrete stock-pile partitions and tunnel conveyor with sand hopper at right.

# AMERICAN

BECAUSE it is the largest producer of sand and gravel in this country and probably any other country, and because of its reputation for progressiveness and sound engineering, a new plant built by the American Aggregates Corporation is always worthy of a description in these pages. This company, with main offices in Greenville, Ohio, operates 24 plants in Illinois, Indiana, Michigan and Ohio, producing sand and gravel, crushed stone, slag, mineral wool and concrete products. Of these plants 14 produce sand and gravel and have a combined capacity of about 10,000,000 tons annually. The average output in recent years, however, has been about 4,000,000 tons.

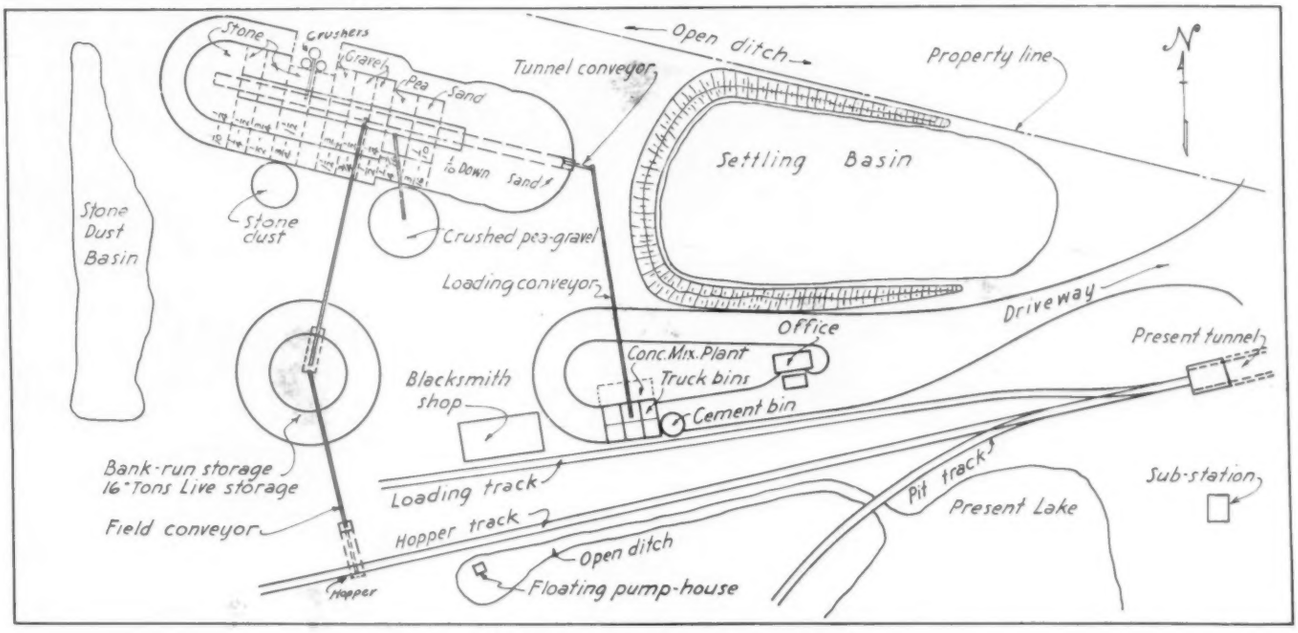
The company's newest plant is located near the Scioto River, near the center of Columbus, Ohio, and replaces an old plant less than a mile away which had been operated since about 1910 and recently ran out of material. The new plant has a productive capacity of about 300 tons per hour. It went into operation late in July, 1940.

Incorporated in this plant are many of the features which are standard in most of the company's plants. These include the use of a rotary primary scrubbing screen, vibrating sizing screens, ground-storage type bins with a reclaiming tunnel conveyor, and practically permanent white-oak, steel and concrete construction, throughout. The blending of any two or more materials is, of course, provided for. Provisions are made for crushing up to 50 per cent. of the input of gravel. The sand-classifying department is flexible enough to retain sufficient minus 100-mesh sand to meet any specifications. A raw-material surge pile insures the plant against the interruptions caused by minor delays in the pit.

The deposit of 240 acres is at present a golf course and extends about 20 feet below ground water level. The overburden is light and is not removed. About 80 per cent. of the material is gravel, and about 40 per cent. is over 1½ inches in size, making considerable crushing necessary. Its composition is that of a very hard limestone. The excavating is done with a No. 24 Bucyrus-Erie drag-line, which has a 100-foot boom and a 4-cubic yard light-weight drag-line bucket. This machine has been converted from steam to electric power.

The excavated material is placed in a 20- by 20-foot steel hopper which straddles the loading track. A sloping 14-inch grizzly over the hopper rejects the oversize. This hopper is moved by raising it with special jacks attached to

# AGGREGATES' NEW COLUMBUS PLANT



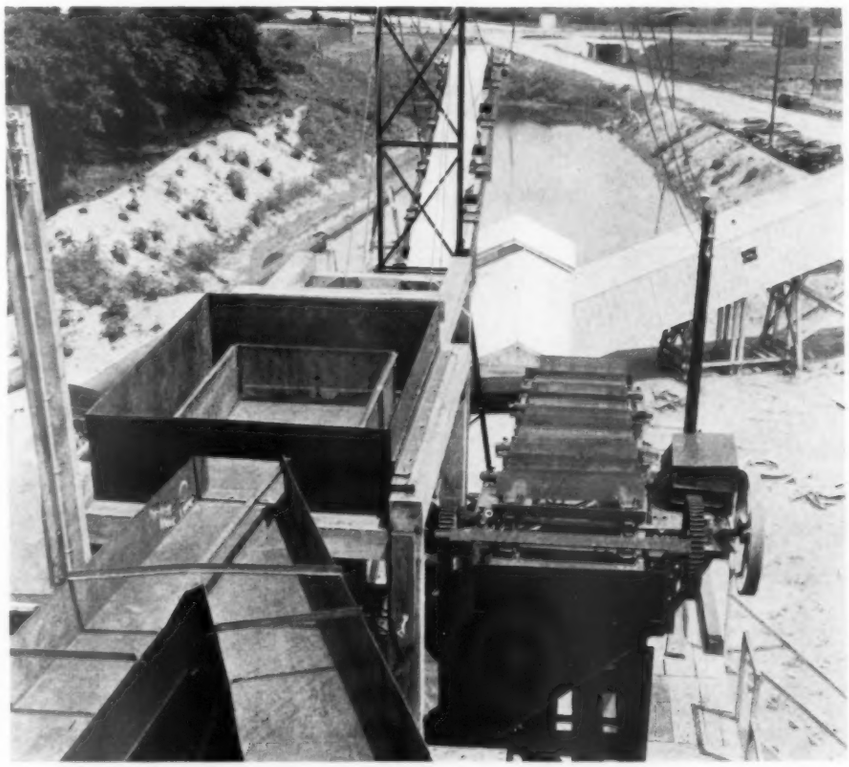

Plan of property and new North plant at Columbus.

a car kept available for this purpose.

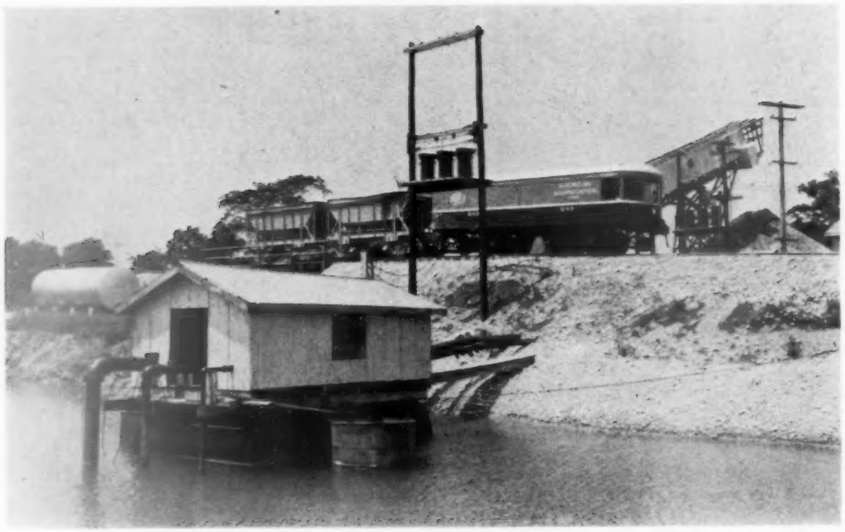
Aggregates are transferred from the hopper to two 40-cubic yard bottom-discharge steel ore cars, which are hauled in a train by an interurban car rebuilt in the company's shops at low cost into an efficient Diesel-electric locomotive. The company has for some time been buying old electric-railway freight cars, cutting about 10 feet out of the middle and installing Diesel-generator sets. All are equipped with Cummins 250-horsepower Diesel engines. The cars' original drive motors to the axles are retained. Each of these cars has one engine except a car now in use at the company's Oxford, Michigan, plant. This car is being left full length and will have two 250-horsepower Cummins Diesel-generating sets. The car at the new North plant has a 250-horsepower Cummins engine which drives direct a Westinghouse 300-kilowatt 600-volt direct-current generator. Gates V-belts drive a small direct-current generator and an air-compressor for the brakes and motor starting. By converting these cars the company obtains a heavy, powerful Diesel-electric locomotive at low cost.

The ore cars are hauled up an earth fill and discharge their contents into a 3-car capacity track hopper. An inverted arc gate, controlled by wheel-and-cable from ground-level, feeds the material on a 30-inch by 165-foot inclined belt-conveyor, from which it is discharged into a raw-material stock-pile. This pile holds about 4 hours' capacity and insures the plant against interruptions from minor delays in pit operation. It also makes possible operation of the pit in the morning and the plant in the afternoon during periods of low demand. The discharge end of the conveyor is 45 feet above the top of the reclaiming tunnel under the pile which is at ground level.

Material is withdrawn from the raw stock-pile through an inverted arc gate which is controlled by a cable and a wheel at ground-level. In order to insure a steady feed to the plant a smooth-roll feeder of the company's own design was installed below the gate. This is driven by a chain from the tail pulley of the 30-inch by 200-foot inclined belt-



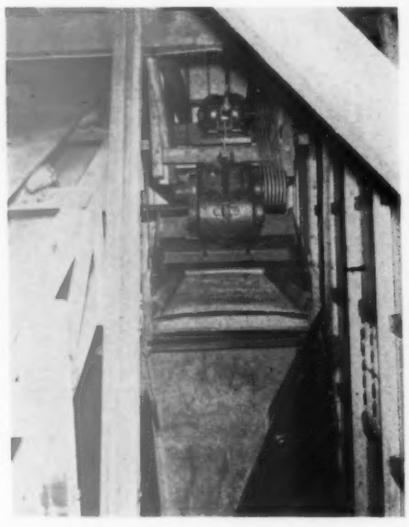
The sand-classifying department with flumes from screen feeding special dewatering tank. Pea-gravel screen is below and drag is at right.



Diesel-electric locomotive rebuilt from old electric-railway freight car at track hopper with raw-material-stockpiling conveyor in background.

conveyor which carries the material to the top of the screening plant.

There the material is discharged into a 5- by 26-foot Greenville revolving screen, which has 1½-inch perforated plate on its main barrel. The 11 foot long middle jacket has ¾-inch openings and the 10 foot long outer sand jacket has ¼- by ¾-inch slot perforations. The fine gravel retained on the sand jacket goes to storage. The material retained on the middle jacket is carried on a 24-inch by 18-foot belt-conveyor to a 4- by 8-foot Simplicity 2-deck screen making two grades of gravel which drop into storage. The sand coming from both these screens is flumed to a dewatering tank, which consists of a 6- by 10½-foot steel tank 2½ feet deep with a 4- by 8-foot pan elevated above the bottom and spaced 12 inches from the sides of the tank. On the plate is a 24-inch-high fence of 10-mesh wire cloth. The sand and water flow on this pan, and much of the water and fine sand drains off through the fence. The sand is discharged on a 4- by 8-foot Simplicity 2-deck screen which removes pea gravel on its $^3/_{16}$-inch top deck and grits on its bottom deck. Both these materials drop through chutes into storage. The sand passing through the 10-mesh bottom deck plus



The 3-deck screen used for final sizing of crushed gravel with its feed conveyor at left.

Truck-loading bins with cement handling and storage equipment for concrete mixing plant in foreground.

the sand passing through the fence is fed into a 4- by 27-foot Greenville sand-drag. The overflow from the drag goes into a 12- by 16-foot plain sand-settling tank. The fine sand settled out in this tank is pumped by a 2-inch Amsco sand pump to an 8-foot diameter dewatering cone. The products of the cone and the drag are carried together on a 24-inch by 50-foot belt-conveyor to storage. By the above method, ample 50- and 100-mesh fines go into the concrete sand to meet specifications. These fines would otherwise have been wasted.

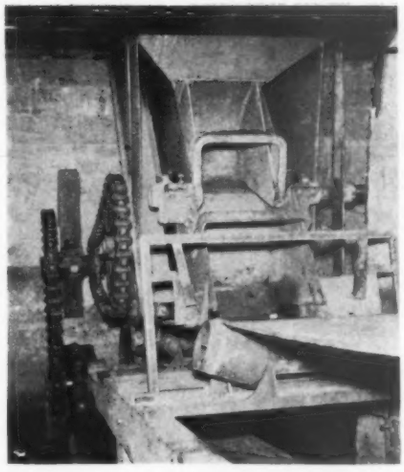
The gravel passing over the 1½-inch main barrel of the revolving screen and, when desired, the other sizes produced, go through chutes to different-sized crushers. A 4-foot Symons cone and two Allis-Chalmers gyratories, one a 7½D and the other a 4K, are used.

An 18-inch pitch Greenville super-capacity bucket-elevator, operating on 66-foot centers, carries the crushed gravel to a 4- by 8-foot Simplicity 3-deck screen. The dust passing through the bottom deck of this screen drops through a chute to storage. The crushed gravel retained on the top deck

The 3-deck screen which scalps oversize crushed gravel to secondary reduction crushers.

is chuted to the 4-foot Symons cone crusher for further reduction. If desired, the same chute can also feed the Allis-Chalmers Gates 4 K reduction crusher. The products of these crushers are carried on the above-mentioned elevator back to the same screen. The two sizes of crushed gravel retained on the two bottom decks of this screen are carried on a 24-inch by 45-foot belt-conveyor to a 4- by 8-foot Allis-Chalmers Low-Head 3-deck screen. The three sizes of 100 per cent. crushed gravel retained on its decks are chuted to storage. The small amount of undersized material passing through the bottom deck is flumed to a storage pond from which it can be reclaimed.

The storage system under the screening-and-classifying department consists of ten ground-level stock-piles, of which four are used for crushed gravel, four for plain gravel, one for the 10-mesh to $^3/_{16}$-inch sand fraction, and one for the minus 10-mesh sand fraction. Under these stock-piles is a concrete reclaiming tunnel with its top at ground-level. Above this tunnel, and poured as a part of it, are nine concrete bulkheads, roughly triangular in shape, which extend upward and outward from the top corners of the tunnel to points 12 feet



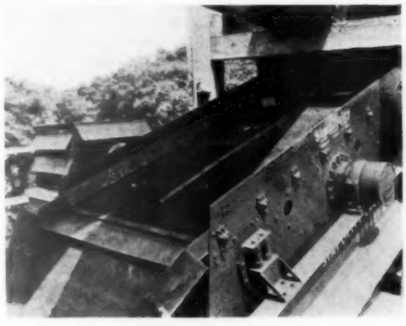
The inverted arc gate and chain-driven smooth-roll feeder under the raw-material stock-pile.

above its top. The angle of the bottoms of these triangles is approximately the angle of repose of the sand and gravel. This unusual design was adopted in order to save the unnecessary expense of separating the various sizes of material in the "dead" sections of the piles. These inverted concrete bulkheads are supported at their ends on concrete pillars. Wooden partitions extend upward from them and support the screening-and-classifying equipment.

The concrete reclaiming tunnel is 6- by 6-feet inside and is 265 feet long. Materials enter it through 22 openings and inverted arc gates—four for the fine sand and two for each of the other products—and fall on the 30-inch by 283-foot belt- conveyor inside. The two center openings under the fine-sand pile are surrounded by a steel double hopper. This consists of a triangular structure, the full width of the tunnel and 8 feet high, with sides sloping from the peak down to the tunnel openings. Built on each side of this are the three sides which form two steel hoppers. Attached to the long slopes of the center structure are electric vibrators. This system is intended to insure a steady feed of this material, which usually contains considerable moisture.

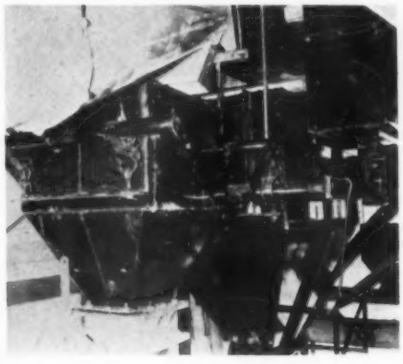
The stored materials can be reclaimed singly or in any desired blends on the tunnel conveyor. The minus 10-mesh sand is sold as masons' sand. For concrete sand the 10-mesh to $\frac{3}{16}$-inch grits and the fine sand are blended on the conveyor.

The tunnel belt-conveyor is inclined for a short distance at its discharge end to discharge on a 24-inch by 180-foot belt-conveyor placed at right angles to it. This conveyor carries these materials to the top of the loading building under which is a 9-compartment, 900-ton oak and concrete bin. A split chute



The 2-deck vibrating screen which removes pea gravel and grits from sand which goes to drag.

allows them to be discharged either through a turn-head to any of six bins or on a 4- by 8-foot Simplicity 2-deck screen for rewashing. All the sizes of uncrushed material are rewashed except the pea gravel and sand, which are discharged through split chutes into any of the three remaining bins. Usually three sizes of gravel, three sizes of crushed gravel, two grades of sand, and pea gravel are stored. At present all shipments are made by trucks which are loaded through sliding gates under the bins. The shipments are weighed on a Fairbanks truck scale at the plant office. Arrangements are also made to chute the materials direct into cars from the last conveyor for rail deliveries. This 900-ton bin storage is also used to supply dry aggregates to a

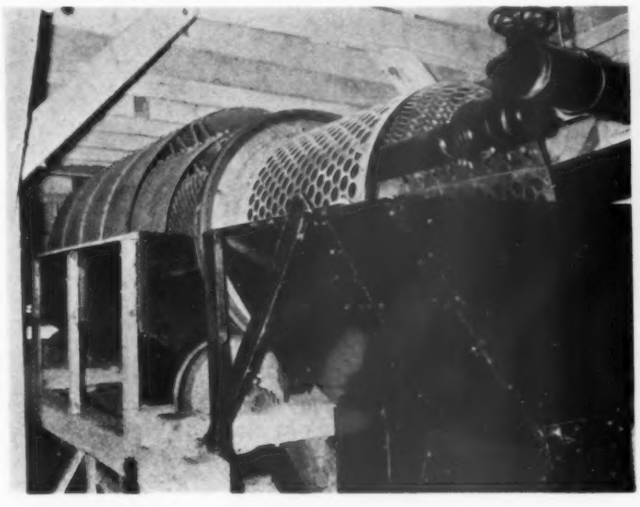


Weigh batchers for loading concrete mixer-trucks. Cement screw and batcher are in foreground.

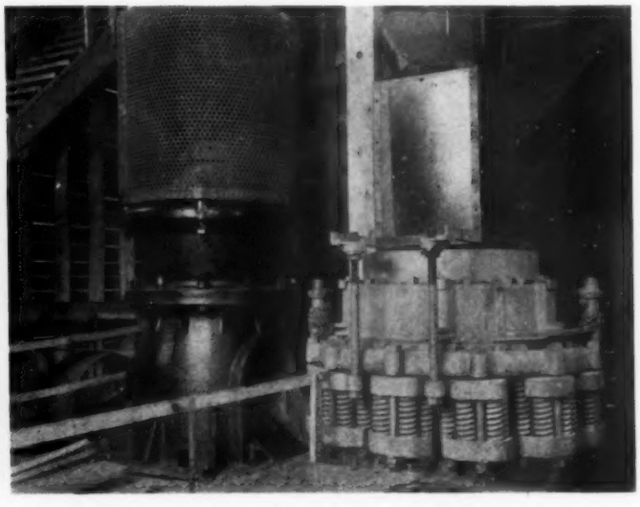
batching plant erected adjacent to the storage bins and operated by the corporation.

A Kinney weigh-batcher has been installed under the loading bins to weigh materials from any of the three gravel bins or the concrete-sand bin. Cement is unloaded from cars to a Columbus screw-conveyor, and a Columbus bucket-elevator feeds it into two 112-ton circular steel tanks. Columbus inclined screw-conveyors feed the cement to another Kinney batcher. A third weighing batcher of the same make is used to weigh out small orders of pea gravel, masons' sand and other aggregates.

The installation of the cement-handling equipment, together with the weighing batchers in connection with the loading-bin storage, is a comparatively new undertaking. This arrangement allows the producer of the aggre-



The 5- by 26-foot triple-jacketed revolving screen which makes gravel sizes and removes sand and oversize gravel.

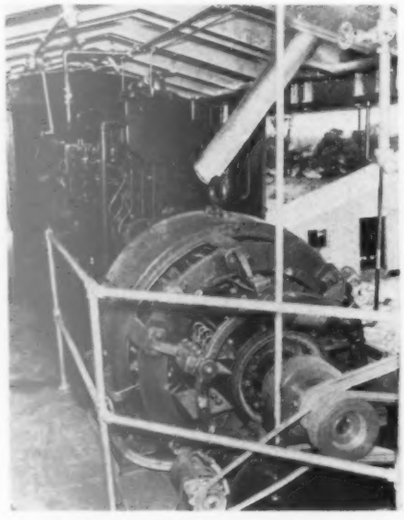


The cone crusher and one of the two gyratory crushers used for the production of crushed gravel.

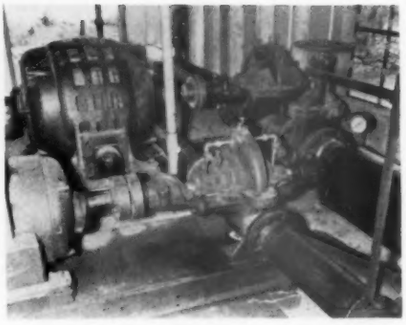
gates to supply not only the aggregates but the cement and water as well, correctly measured, weighed and delivered into the transit-mix trucks of the ready mixed concrete dealer or the contractor, thus eliminating the usual rehandling of the aggregates. It is not the intention of American Aggregates Corporation to produce and deliver ready-mixed concrete, instead their plan is to furnish the materials, including the cement and water, delivered into the mixing trucks of the already established ready-mixed-concrete dealers. Provisions have been made in the construction for the installation of concrete mixers in connection with the batching plant so that if there is a demand for pre-mixed concrete in the future, they can readily arrange to furnish same.

Water for washing purposes is obtained from the lake which is being formed by the pit excavation near the plant. The pump-house floats on steel pontoons and the pump pipe-lines have flexible couplings connecting to the shore lines to compensate for the slight fluctuations in the water-level. An 8-inch Fairbanks-Morse pump supplies most of the water used and its line which runs from the pump-house to the main plant is expanded to 15 inches. A 6-inch pump supplies water through a split connection both to the 15-inch main water-line and to a 6-inch line to the rewashing screen in the loading building. A 2-inch Goulds pump is used for priming. The washing is done on all the screens except the sand screen by means of perforated pipe sprays.

Much of the equipment used in this plant was made in the company's own shops. This includes the revolving screen, the feeders, gates, chutes, elevators, sand-classifying equipment and the conveyor idlers. The idlers are made to a design the company has used for many years and which is said to reduce considerably the longitudinal cracking of belts. Each idler assembly consists of a long horizontal idler with an inclined idler at each end but not in the same vertical plane. As the lower ends of the inclined idlers extend below the level of the top of the horizontal idler the belt is supported for its full width.



The 250-horsepower Diesel engine and the generator operating the rebuilt car used as a locomotive at this plant.



View of the two water pumps showing how 8-inch line is expanded to 15 inch and how 6-inch line is tapped into it.

Most of the electric motors used in this plant are new and of various makes. Goodyear conveyor belts are used on the two plant-feed conveyors. Goodrich belts are used on the tunnel and loading belt-conveyors. Gates V-belts are used to drive the screens, crushers, conveyors and the elevators. Jeffrey chains are used on the roll-feeders.

The design and construction of the new plant at Columbus is such as to more nearly meet the present trade demands and at the same time reduce the operating costs. Specifications governing the furnishing of aggregates are becoming more and more exacting. The sizing must be accurately done; more separations are required and soft stone must be eliminated; sand must be a proper mixture of various sizes from ¼-inch down including consistently a percentage below 100 mesh. Aggregates must be furnished dry—varying quantities per day are required by the trade—all of which and many other requirements were considered when the plans were drawn for this new plant.

## Gypsum Industry Sees Three Eras of Growth

The growth of the gypsum industry may be divided roughly into three periods, each of which is notable for the greater acceptance of particular products, the Bureau of Mines points out.

During the first period, which lasted until 1910 or 1912, the use of gypsum wall plasters, particularly those for base-coat work, began to expand rapidly after about 1898 and soon became the common plastering materials for all except finish-coat work. Two new products, gypsum board and tile, which were introduced before the end of the first period, came rapidly to the fore and contributed materially to the rapid growth of the industry that took place during the 1920's. War-time construction, chiefly of a temporary nature, called attention to the desirable qualities of gypsum wallboard and tile, so that they were accepted readily for use in permanent buildings between 1920 and 1930, and consumption of these products increased steadily through this boom period.

Meanwhile the use of gypsum lath also expanded, but not enough to make it a common material of construction until the general decline that engulfed all building activity in 1930 and 1931. Gypsum lath resisted this decline better than did other gypsum products, forecasting the growing demand that came later. As building activity emerged gradually from the low levels of the early 1930's, gypsum lath was the first product to recover, and after 1935 sales of this article set new records each year.

## Effect of Acid Mine Waters on Cements

Information of interest in connection with the use of cements for concrete structures in mines has been obtained as the result of tests on the effect of acid mine waters on various cements, conducted by the Bureau of Mines. The results of these tests are presented in a report just published by the Bureau.

Although, due to certain limitations, the tests were not comprehensive, they indicate that up to a certain point the use of acid mine water for mixing gives greater tensile strength to some cements than does the use of water of the quality recommended by most cement manufacturers. Marked differences were shown in this respect by six different types of cement.

Neat cement slabs prepared by mixing the six types of cements with acid mine water (as well as one other special acid-proof cement) also showed marked differences in the apparent acid resistance after immersion for about 17 months in high-acid mine water.

The information derived from these tests should also be of interest in connection with the use of cements for highway bridges and culverts and for many other structures in places where waters of the generally recommended quality are not available for mixing, and especially where the construction must withstand contact with acid mine waters.

Copies of this report, *Tests on the Effect of Acid Mine Waters on Various Cements,* by R. D. Leitch, chemical engineer, and J. G. Calverley, mining engineer, may be obtained from the Bureau of Mines, Washington, D. C.

# The Lubrication of Equipment

## Part V. Screens

By JAMES I. CLOWER
Associate Professor of Machine Design
Virginia Polytechnic Institute

SCREENS are no exception to all other pit-and-quarry equipment in that they usually operate under adverse lubricating conditions. Atmospheric conditions are generally dusty and dirty and the work is inherently rough and hard. Frequently screens are exposed to water and sometimes chemicals, both which may gain access to the bearings and other lubricated parts.

Most of the parts that require lubrication are generally well protected by dust- and water-proof housings, having seals of various types at the points where the shafts extend through the housings. Most seals are effective when new and when maintained in good mechanical condition. Unfortunately the importance of keeping the seals in first-class mechanical condition is not fully appreciated by all operators. Consequently, it is not unusual to see bearings of screens operating virtually fully exposed to these hazards of lubrication.

*Types of Screens.*—The wide diversification of materials screened and the various requirements involved have led to the development of two general types of screens; *viz.,* revolving or rotary screens and vibrating or shaking screens. The revolving screen comprises essentially a revolving perforated steel cylinder, generally supported at the ends, and a substantial steel frame or foundation, as in Figure 1. The cylinder is rotated by means of gears, usually of the bevel type, the pinion being keyed to a countershaft. The drive is generally by an electric motor through spur reduction gears, a chain or a belt. In one design the cylinder is supported at the ends by a shaft that extends through the entire cylinder. In another design the cylinder is supported at the ends on trunnion rollers, which are supported by bearings securely fastened to the foundation. Revolving screens were at one time extensively used in stone-quarry service, but in recent years have been largely displaced by the more efficient vibrating and shaking screens.

A vibrating or shaker screen consists essentially of one (Figure 2), two (Figure 3), three (Figure 4) and sometimes four decks of screens supported by rigid frames, a vibrating mechanism, and a main frame or foundation. The shaking of the screen assembly is effected by the vibrating mechanism and the material is screened much in the same manner as ashes are sifted in a hand screen.

*Vibrating Mechanisms.*—The vibrating mechanism is the heart of any vibrating screen. In general, two distinctively different types of mechanisms are employed to produce the desired shaking motion.

First, is the eccentric type, which is constructed in two different ways. In one design, the screen assembly is attached directly to the drive shaft by eccentric roller suspension bearings, the inner race of the bearings being bored eccentric with respect to the outer race, as in Figure 5. In the other design the same result is accomplished by turning the journals of the suspension bearings eccentric with respect to the journals of the supporting bearings, as in Figure 6.

Most eccentric-type screens have the eccentric shaft rigidly fastened to the screen assembly, as in Figure 5. In such designs the motion of the screen assembly is simple harmonic or, as it is sometimes called, uniform circular motion. In other designs the eccentric shaft is connected to the screen assembly by flexible leaf springs, as in Figure 6, or by connecting rods. In this design the screen is given a more complex motion, similar to that of an engine piston.

In the second type the vibrating mechanism consists of unbalanced weights, which may be exposed unbalanced flywheels, or fully-inclosed counterweights, as in Figure 7. Generally,

Fig. 2—Heavy-duty, positive-drive, single-deck vibrating screen.

the design of the unbalanced weights is such that the degree of unbalance may be altered by changing the position of the weights with respect to their center of rotation; thus altering the amplitude of the vibration to suit the material being screened. The vibration produced by this type of mechanism is a dancing action and is not positive, whereas the motion produced by the eccentric-type mechanism is positive under all conditions of loading.

Both types of vibrating screens are made in either inclined or horizontal designs. The throw or stroke of the eccentric type screen is generally fixed, although some are so designed that the throw of the eccentric is adjustable, as in Figure 8. This allows the motion to be altered to suit the material in question. In order to reduce the vibration of the supporting frame of the ec-

Fig. 1—A battery of four 5- by 24-foot closed-end revolving screens in a large stone-crushing plant.

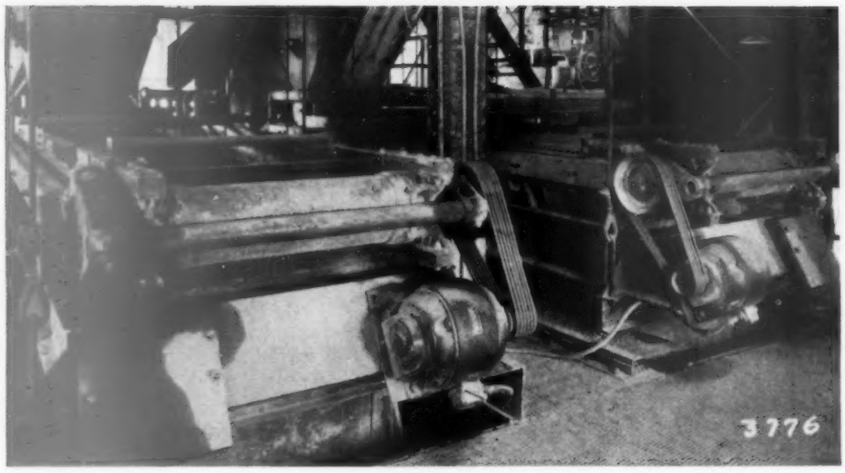



Fig. 3—Two double-deck screens installed in a crushed-stone plant.

centric type, the eccentric shaft is generally equipped with counterweights, as in Figures 5 and 8.

The efficiency of the vibrating screen depends primarily on the motion of the screen. Screen manufacturers have determined the most efficient motions for their screens and have accordingly designed the vibrating mechanisms so as to produce the most effective motions. Excessive bearing clearances, caused by wear, destroy in part the motion of the screen assembly; thus reducing the performance of the screen. Since the prevention of undue wear is largely a matter of lubrication, the satisfactory operation of vibrating screens depends mainly on the correct lubrication of the screen at all times.

*Revolving Screens.*—The parts of revolving screens that require lubrication are the bearings of the countershaft and those that support the revolving cylinder and the gears. Both plain and roller bearings are used and are generally grease-lubricated. The plain bearings are usually fitted with grease cups like, or similar to, those shown in Figure 9. Figure 9A is an inexpensive design and is the type most generally used. Figure 9B has a leather gasket, which minimizes leakage of light-consistency grease or heavy grease at high temperature. Figure 9C has an internal friction spring that keeps the top from unscrewing due to vibration. The top of the cup shown in Figure 9D is provided with a threaded hole for a grease-gun fitting; thus it can be filled without removing the top. The cup shown in Figure 9E is equipped with a ball check valve, which prevents water from backing up into the cup.

Fig. 4—A triple-deck screen installed in lime and stone plant.

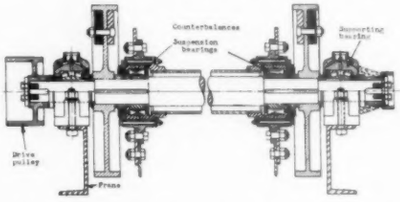



Fig. 5—Section through drive units of an eccentric-type screen, showing bearings, eccentrics, drive shaft, and bearing seals.

The roller-bearings of revolving screens are generally grease-packed, often being fitted with gun fittings, two types of which are shown in Figure 10. The button-head fitting, Figure 10A, is the more commonly used type of the two for revolving screens.

For filling bearings equipped with gun fittings a grease gun is required, two designs of which are shown in Figure 11. These are the most generally used designs and are typical of the hand-operated guns. Figure 11A shows the screw-plunger gun equipped with the button-head coupling. By turning the handle, *H*, the leather-packed plunger is moved toward the discharge end of the gun, forcing grease out of the gun. With this gun a pressure of 2,000 p.s.i. can be produced.

Figure 11B shows the hydraulic-type gun provided with filler-type handle, *i.e.*, the gun is charged with grease through its handle. When this gun is pressed against the fitting, the sleeve, *S*, slides back on the plunger, *P*, and forces a measured amount of grease into the bearing. Upon releasing the pressure, the spring returns the sleeve to its forward position. The discharge port is automatically closed by the ball check, and a fresh charge of grease is taken into the sleeve. This gun is capable of producing a pressure as high as 10,000 p.s.i. The quantity of grease delivered per stroke can be varied in this gun by using collars of different lengths between the nozzle, *N*, and the shank, *K*, thus varying the length of the stroke.

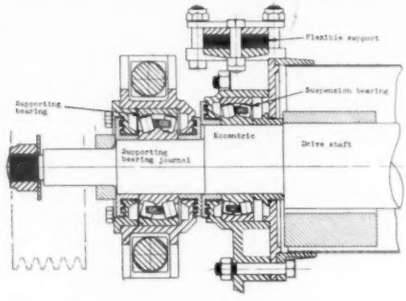



Fig. 6—Section through drive unit, showing eccentric shaft, self-alining bearings and seals.

The trunnion bearings of some of the older designs of revolving screens are designed with open wells or windows for packing with elastic wool-yarn grease.

The gears of most revolving screens are exposed and are lubricated by hand, using a swab, paddle, or brush.

*Vibrating Screens.*—Virtually the only parts of vibrating screens that require lubrication are the suspension and supporting bearings. Since it is highly desirable to have very little clearance in these bearings in order to insure the proper motion of the screen, they are generally of the roller type. Where these bearings are inclosed in oil-tight housings, as in Figure 7, they are usually splash-lubricated. Where they are exposed, as in Figures 4, 5, and 6, they are generally equipped with grease-gun fittings, similar to those used on revolving screens.

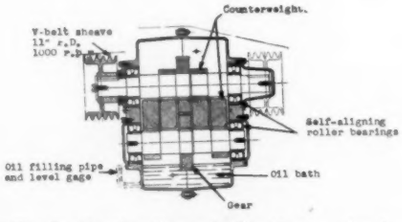



Fig. 7—Section through vibrating mechanism of the screen shown in Fig. 2.

*Lubricants Required.*—For roller-

bearings equipped with gun fittings, as in Figures 5 and 6, the grease should be a well-made product composed of a high-grade *soda-soap* base and a well-refined neutral mineral oil, having a viscosity of about 500 seconds Saybolt Universal at 100 degrees F. The grease

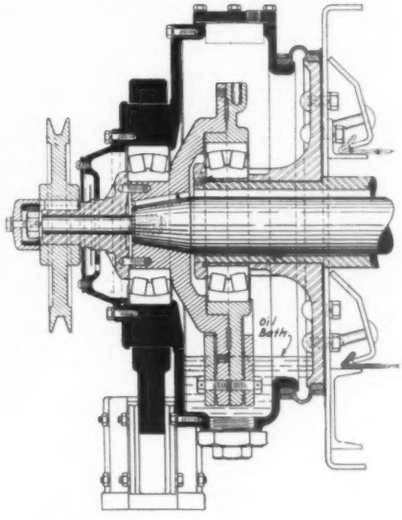



**Fig. 8—Section through an inclosed, eccentric-type shaker mechanism showing bearings, counterweights, and device for changing the throw of the eccentric.**

should contain no fillers, such as rosin, rosin oil, wax, powdered mica, clay, asbestos, or other undesirable or deleterious impurities. Although calcium-base greases are used by some operators for these bearings they are not to be generally recommended, because of their tendency to separate at high speeds and/or, high temperatures. All calcium-base greases contain from 1 to 2 per cent. of free water, which acts as a binding agent to prevent the soap base and mineral oil from separating. In high-speed roller-bearings this free

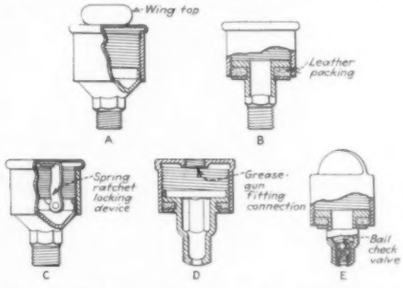



**Fig. 9—Designs of grease cups commonly used on plain bearings of screens.**

water is thrown out by centrifugal force; at high temperatures (above 160 degrees F.) this water is vaporized. Consequently, in either case, separation of the soap and oil occurs.

For roller-bearings it is essential that the grease possess the correct consistency. Too heavy grease causes the bearings to overheat; too light grease usually results in excessive leakage and rapid wear. In general, a No. 2 grease will be found suitable for summer use and a No. 1 grease for winter use. Some greases, however, maintain their fluidity at low temperatures and are suitable for year-around service. If difficulty is encountered in cold weather in starting, the grease is probably too heavy and should be flushed out and replaced with a lighter-consistency grease, or thinned by the addition of a small quantity of low cold-test oil.

Care should always be taken not to overlubricate roller-bearings. The frequency of application and the quantity supplied per application vary with the size and make of screen. In general, however, one application per day is sufficient; preferably, this should be done at noon. Gun fittings should be thoroughly cleaned of dust and dirt before attaching the gun to the fitting. When changing from a lighter to a heavier grease or *vice versa,* the bearings should be thoroughly flushed with kerosene, preferably at the end of a day's run.

For plain bearings equipped with grease cups a calcium-soap grease of

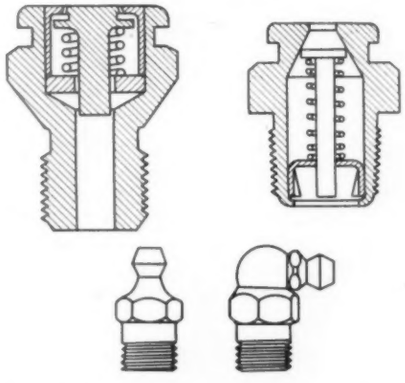


**Fig. 10—Typical grease-gun fittings used on screen bearings.**

No. 2 consistency is suitable. It should be a well-made grease composed only of the soap base and mineral oil.

The proper lubrication of the gears of revolving screens is a more difficult problem than that of the bearings. In general, these gears are fully exposed, which alone makes correct lubrication very difficult even under the most favorable conditions. It is essential that the lubricant used possess the ability to form an adhesive protective film over the teeth to prevent the abrasive action of dust and dirt. This film must be established and maintained under all temperature and moisture conditions encountered in service. Experience has proved that the most effective lubricant under these conditions is a straight mineral residual product having high adhesive ability and which will not "ball up" with dust, scale off, or be thrown off by centrifugal force. Usually, such a product should have a viscosity of approximately 300 seconds Saybolt Universal at 210 degrees F. Where no provision is made to prevent dripping and the temperatures are above normal, a product of the same general character but having a higher viscosity is required. In some instances it is necessary to use a product having a viscosity as high as 1,000 or even 2,000 seconds Saybolt Universal at 210 degrees F. In order to cover the teeth uni-

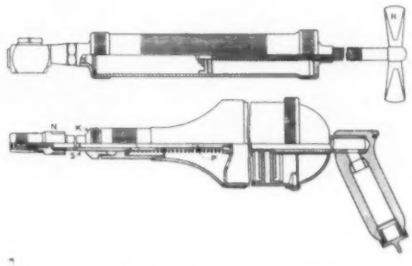


**Fig. 11—Two hand-operated grease guns.**

formly, such heavy products should be heated until they are quite fluid and then applied hot with a brush.

Most screens having inclosed vibrating mechanisms are splash-lubricated (Figures 7 and 8), thus requiring a liquid lubricant. In those units the oil is subject to severe splashing as the counterweights strike and splash the oil on all parts of the mechanism. This breaks the oil into fine sheets and droplets, thus intimately mixing it with the air. This rapid and continuous splashing of the oil generates considerable heat, which, coupled with the aëration, tends to oxidize the oil. If water is allowed to leak into the housing through faulty seals, it is at once thoroughly mixed with the oil to form a strong emulsion.

The oil required for inclosed units must, therefore, possess the correct viscosity in order to minimize the generation of heat; it must be highly stable chemically to resist the strong oxidizing factors; if water is present it must be highly resistant to emulsification. These characteristics are possessed to the highest degree by straight highly-refined mineral oils free from all impurities, such as acids, soaps, fatty oils, resins, and all other nonhydrocarbon matter. Compounded oils should never be used in these units as they are less stable than pure mineral oils.

For temperatures below freezing the viscosity of the oil should be approximately 225 seconds Saybolt Universal at 100 degrees F., and it should have a pour point at least as low as the lowest atmospheric temperature likely to be encountered. In general, the pour point should be well below 0 degrees F.

For temperatures between freezing and 90 degrees F. the viscosity of the oil should be approximately 330 seconds

*(Continued on page 43)*

Part of the plant with cupola stack at extreme left, blowing room in center and packing department at right.

# Pioneer Wisconsin Stone Firm Erects Mineral-Wool Plant

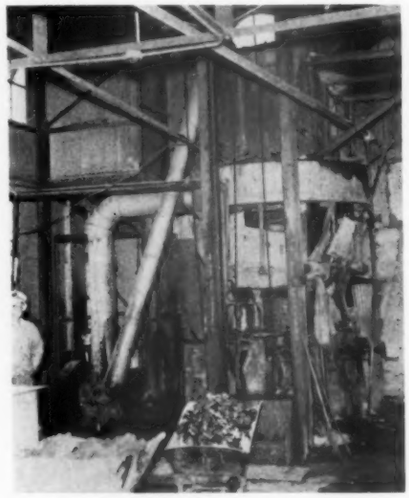
THE growth of the mineral-wool industry in the last decade was one of those phenomena which sometimes occur when a product which meets a large and long-felt need becomes available at a reasonable price. Ten years ago this product was unknown to the general public and was made in only a few plants. Now nearly a hundred plants produce it and most new houses being built are insulated with it. Dozens of other uses have been found for this cheap but effective insulating material.

In the early stages of the growth of this industry little was known about mineral-wool manufacturing methods and each producer entering this field had to develop most of his own methods and equipment. This condition still exists to a considerable extent as is evidenced by the experiences of the Waukesha Lime & Stone Company, Waukesha, Wisconsin. This company, a producer of crushed limestone since 1905, from 1920 to 1930 furnished stone for rock-wool manufacture to a firm in a neighboring city. When these orders ceased Mrs. M. O. Gillen, president and general manager of the company, considered going into this field but was deterred from doing so by the rapid decline in building construction.

When business began to improve experiments were conducted in a local foundry which used this stone for flux. No steam was available but wool blown with air from a grey-iron cupola was of good enough quality to justify going ahead with the construction of a plant.

The present plant was completed early in 1939 and only minor changes have since been necessary. This plant was the result of the combined efforts and ingenuity of Mrs. Gillen, F. C. Wolf, general superintendent, and his son C. G. Wolf, plant superintendent. The latter took care of most of the details of building the plant and getting it in successful operation.

Practically all the equipment used was built in the company's shops. The few changes necessary since the plant went into operation attest to the thoroughness with which the job was done.



The cupola with skip bucket, barrows of raw materials and scale in foreground.

The only important changes were the replacement of the original 25-horsepower boiler with one of 75 horsepower and enlargement of the blow room. The plant operates continuously, but must be shut down every 4 or 5 days for replacement of the fire-brick lining of the cupola. This relining takes less than a day.

The entire plant is housed in a prefabricated-steel building which is absolutely fireproof. The raw materials used are limestone, slag with a high calcium-carbonate content and a few minor ingredients which promote melting instead of calcining in the cupola. These ingredients and the coke used as fuel are weighed on a platform scale in wheelbarrows and are dumped into a skip bucket from which they are discharged into the cupola. This cupola is of the continuous type and is kept nearly full at all times. It was built as an experiment and has a capacity of 11 tons in 24 hours.

This view of the cupola shows the main stream split before blowing.

High-pressure jets of steam hit the two streams of molten material and blow them into a blowing room, which is 20 feet wide, 16 feet high and 60 feet long. Later a larger cupola of double the capacity and with two discharge openings will be installed. Each stream may be split in two as the blowing room is large enough to take care of the added capacity. All the other equipment in the plant can easily handle double the present output.

The wool settles in a blanket on a flat steel slat-conveyor which forms part of the floor of the blowing room. A roller at the point where the conveyor leaves this room, another at the dis-

charge end of the conveyor, and a third half way between these two compress the blanket of wool to the desired thickness.

The conveyor is driven by a 1,750-r.p.m. motor through a speed-reducer, a variable speed-reducer, chain and gears. The thickness of the blanket is controlled by varying the speed of the conveyor. The compressing rolls are driven by chain from the conveyor roller shafts. At the end of the conveyor a saw, consisting of seven smooth disks equally spaced on one shaft, cuts the wool blanket longitudinally into six 15½-inch strips. Six short conveyors at the end serve as a loading table. A fan collects fumes and dust from the blanket through a hood near the end of the conveyor.

At first only bulk wool was sold and strips were rolled up and sold in rolls or in paper and cloth bags. In July, 1940, a cross cut saw of own-design was developed which automatically cuts the six strips into batts 24 inches long. The batts were packed with paper on both sides to prevent adherence, but because of the high cost of paper the company soon obtained a license to use a stiffening chemical to make the wool hold its shape and not pull loose. This chemical is blown into the blowing room through small nozzles close to the wool nozzles by the same jets of steam. In this way practically every wool fiber receives a thin coating of this chemical.

The cross-cut saw assembly consists of a 22-inch circular saw mounted on the shaft of a 3-horsepower 1,750 r.p.m. reversible electric motor. Attached to

F. C. Wolf, general superintendent and his son, C. G. Wolf, plant superintendent.

the motor, and driven from it by chain and gears, is a drive-shaft with gears on each end. These support the assembly on two parallel gear tracks which extend across the full width of the conveyor. As the conveyor moves slowly along an automatic trip every 24 inches makes an electrical contact, starting the motor and saw. As the motor reaches a suitable speed a clutch automatically engages the drive-shaft and the assembly speeds across the gear track making a cut. The motor receives its power through a trolley running on a track which extends about 24 inches beyond the starting position of the motor. Near the end of the track is a switch which is tripped as the motor goes by, shutting off the power and resetting the switch for the next cut. The assembly speeds on across the track under its own momentum and is stopped by a spring bumper on the other side. A similar switch-and-track arrangement on the other side takes care of the return trip on which the motor rotates in the reverse direction. The action as described above sounds complicated but actually the saw starts up and the cut is made faster than one can say "Blitzkrieg."

The batts are packed in paper-board boxes 4 feet long, which hold 20 square feet of 4-inch thick batts. Loose wool is packed in cloth or paper bags or in rolls. The cloth bags are returnable. The strips cut off the sides of the blankets by the gang saw are granulated and sold in bulk. As no granulators were on the market, according to Mr. Wolf, one was designed and built in the company's shops and this has been working very satisfactorily.

There is storage space for about 96 hours' production.

Sales are made through dealers and insulating contractors and are confined principally to the Milwaukee area.

The discharge end of the conveyor with saw in the middle of a cut. Collector hood over conveyor is shown.

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## Clower *(from page 41)*

Saybolt Universal at 100 degrees F. For temperatures in excess of 90 degrees F. the viscosity of the oil should be about 900 seconds Saybolt Universal at 100 degrees F.

Since inclosed vibrating units are not equipped with an oil-filtering system of any sort, it is necessary to drain out the used oil periodically and replenish it with fresh oil. In most instances if the screen is operated from 8 to 10 hours per day, the oil should be drained every 10 days to 2 weeks. If it is operated continuously the oil should be changed every 80 to 90 hours.

Since splashing the oil is depended on to supply the oil to the bearings and other parts of inclosed units, it is very important that the oil be carried at the correct level at all times. If the oil level is too low, insufficient lubrication results, whereas excessive churning and heating of the oil are caused if the level is too high. Care in maintaining the correct oil level tends to promote better lubrication and longer oil life.

The bearings of screens are subject to exceedingly severe service and they are the most expensive parts, not only to buy, but to install. It behooves the operator, therefore, to exercise considerable care in the matter of lubrication of the bearings if he wishes to realize maximum bearing life and minimum operating delays.

# TRUCKS CUT INTRA-PLANT HAULING COST

**By EDWARD H. NEWBY**

WALFORD quarry of the Lake Erie Limestone Company is one of the most recent limestone plants in western Pennsylvania to standardize on motor trucks for intra-plant hauling. Although this company has used railroads and crawler-tractor-drawn equipment in its other quarries, trucks were selected for this new quarry after long and thorough investigation by the quarry management, superintendent and engineer.

In December, 1939 two 15-ton rear-dump Euclid trucks were purchased and put to work in the preliminary work of opening Walford quarry and installing the plant equipment. These trucks are like the Euclid machines used on the Missabe Iron Range except for the special quarry bodies designed by Paul Durbin, superintendent, and H. G. Murphy, engineer, with the coöperation of the truck company's engineers.

In January, 1940 three more 15-ton Euclids were purchased for the final preliminary work and to begin the removal of overburden and the transportation of stone. These five trucks are now hauling all the overburden and stone. Two trucks usually keep each of the stripping and stone shovels busy; the fifth one is used to relieve the others during refueling or servicing or to assist as necessary on longer hauls or special work. These machines are giving good results in economical continuous operation.

The overburden at Walford is about 25 feet deep, consisting of moist shale and clay over the limestone. This is loaded by a 2½-cubic yard Marion shovel into the trucks, which haul it to a near disposal fill. On a haul averaging about 600 feet each way three trucks hauled 3,632 cubic yards in 2 days, totalling 37 work hours, or an average of 98.2 cubic yards per work hours at 8 cubic yards per load. These figures are for the first few days' work on this haul to a new fill. The fill was small, requiring much backing and turning for the trucks to unload. The haul included a 15- to 20-per cent. down-grade ramp varying from 100 to 200 feet in length. The production will undoubtedly increase steadily as the size of the fill increases and the steepness of the ramp decreases.

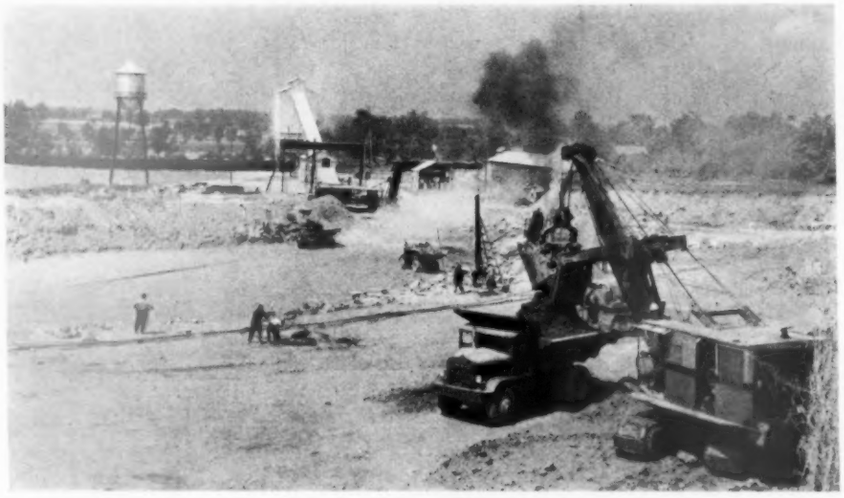
The following time-study check was made on this stripping operation:

| | Average Speed (m.p.h.) | Average Time (min.) |
|---|---|---|
| Receiving 4 buckets from 2½-cubic yard shovel | ... | 1.21 |
| Hauling 530 feet on level rock-and-earth road, dry but fairly rough. | 9.3 | .65 |
| Hauling 100 feet down 15-per cent. ramp and 150 feet on fill and "spotting" for dumping | 1.5 | .78 |
| Dumping load clean | ... | .44 |
| Returning 150 feet off fill and 100 feet up 15-per cent. ramp | 6.7 | .43 |
| Returning 530 feet on level, turning and backing under shovel | 6.9 | .87 |
| Average net round-trip time—loading, hauling and dumping—780-foot haul one way | | 4.38 |

Production per Truck per 50-Minute Work Hour

Loads carried ..... 11.4

Material carried at 8 cubic yards per pay-load ..... 91.2 cubic yards



Truck being loaded with overburden by a 2½-cubic yard shovel. Plant is in distance.

Truck being loaded with stone by a 4-cubic yard railroad-type steam shovel.

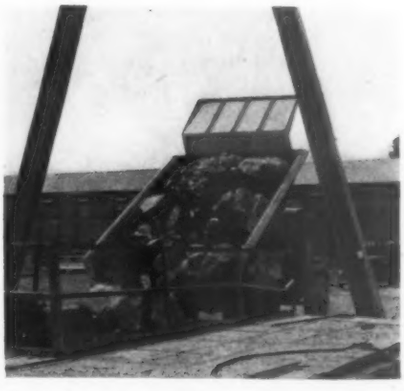
After the overburden has been removed by the shovel and trucks the remaining loose dirt is moved by a bulldozer and a small clean-up gang. Next the limestone is drilled and "shot" ready for loading.

The limestone being quarried has a face of about 21 feet and slopes downward. The quarry will be operated on the present basis until the overburden reaches a depth of about 45 feet, at which time underground mining will be started. Open quarrying will probably proceed for five or six years.

A Bucyrus-Erie 4-cubic yard railroad-type steam shovel mounted on crawlers loads the limestone into the trucks. A workman removes large and sharp stones from the hauling road under the shovel in order to protect the tires from unnecessary abuse. As soon as the trucks are loaded they are driven to the crushing plant. The hauling road passes over an automatic scale a short distance from the crusher. Here each driver stops his truck momentarily on the scale platform, reaches over to operate the automatic weight recorder, and then drives on. This weighing requires about 11 seconds and gives a positive check on the number of trips

A close-up view of shovel loading truck which illustrates the special body design.

Truck loaded with stone being backed into position for dumping into the primary crusher. Plant in background.



Truck-load of stone being discharged into the primary crusher.

and the weights per load. From the scale the trucks are driven about 75 feet ahead to the right and are then backed up straight to the crusher.

At the crusher the trucks are dumped slowly in stages to prevent choking of the crusher with large stones. The workman in charge of the crusher signals the driver, who controls the hoisting of the body from his seat. As soon as the load is dumped the driver starts back to the shovel, lowering the body *en route*. The return hauling road approaches the shovel in a semi-circle so that an empty truck pulls up behind a loaded truck as the latter drives away from the shovel.

Over a 10-day period two trucks hauled an average of 9.7 loads per hour, the average load weighing 13.5 long tons. These figures are the result of an accurate check based on the weight records. The hauling road each way was between 700 and 800 feet long.

Truck driver actuating the automatic weight recorder before dumping his load.

The following time-study check was made on this stone-hauling operation:

| | Average Speed (m.p.h.) | Average Time (min.) |
|---|---|---|
| Receiving 4 buckets from 4-cubic yard shovel | ... | 1.88 |
| Hauling 500 feet to scale | 8.3 | .68 |
| Stopping and weighing load | ... | .18 |
| Hauling 50 feet net, turning and backing to crusher | 1.2 | .47 |
| Dumping load slowly so as not to choke crusher | ... | .77 |
| Returning 800 feet to shovel | 12.0 | .76 |
| Average net round-trip time—loading, hauling and dumping—675-foot haul one way | | 4.74 |

Production per Truck per 50-Minute Work Hour

Loads carried ..... 10.6

Material carried at 13.5 long tons per load ..... 143.1 long tons

From the crusher the stone is transported on a conveyor belt to a large loading tipple, where it is loaded into railroad cars for shipping. The limestone shipped is used primarily for flux in steel-mill blast-furnaces; it varies in size from 1 to 5 inches. The screenings are hauled from the storage bin to a near fill by a Koehring W-60 Dumptor. The screenings may later be used for agricultural limestone or road-building.

At the time of this writing the net limestone production shipped each 12-hour day averaged about 36 railroad cars of 69 long tons, or 155,000 pounds, each. As the quarrying proceeds this production will be increased.

The use of 15-ton rear-dump trucks has decreased the over-all cost of overburden removal and of the quarrying and hauling of limestone as compared to the methods used previously by the same company. This reduction in production costs is primarily due to the low operation and maintenance cost of the Diesel-powered trucks. Savings are also being realized indirectly because of their flexibility and maneuverability. Less time and labor are required to extend cuts, start new fills, and maintain hauling roads. Consequently, there is a more continuous and efficient operation of the entire quarry and plant equipment, resulting in a lower cost per ton of finished limestone.

## McManus, Neary Buy Silica-Sand Company

The South Ottawa Silica Sand Company has been sold by F. A. Cebulske to P. J. McManus and John Neary of Utica, Illinois.

The new owners plan to incorporate as the Acme Silica Sand Company, enlarge the plant and install new machinery.

A panoramic view of the Port Washington, Long Island, sand-and-gravel operations of the William P. McDonald Construction Company.

# Belt-Conveyors Used Extensively at Long Island Sand-Processing Plant

By SPENCER JONES

MASS production of sand to exacting specifications but in an economical manner was the problem faced by the William P. McDonald Construction Company, Flushing, Long Island, New York, when it took over an abandoned 71.3-acre sand pit at "Cow Bay," Port Washington, Long Island, early in 1939. The bank from which the material was to be excavated was about 2,000 feet from the water front, where sand scows were to be loaded, and further excavation would increase this distance continually.

To make matters more difficult two public highways traversed the property between the pit and the water front, one of them, Pleasant Avenue, running along the top of a 100-foot ridge of sand which separated the pit from the shore line. With the working floor of the pit only about 10 feet above mean high tide, this sand ridge was an obstacle of considerable importance. The other, Shore Road, was only about 6 feet above mean high tide.

The new operator also desired to provide facilities for loading the trucks of local contractors at the plant, but neither of these public highways was a suitable means of access for trucks seeking loads of sand because Pleasant Avenue was too much of a climb and Shore Road, the other highway, crossed the property at its narrowest point, near the water front, with no room for storage or loading facilities.

Excavation presented still other difficulties, not because of the properties of the material to be handled, but in the selection of digging equipment, capable of handling at least 2,500 cubic yards of sand daily with ease yet moderate in first cost and operation expense.

Still another problem was that of adequate flexibility and mobility in the excavating and conveying equipment from the foot of the sand bank to the washing and sizing plant. It had to be flexible to meet the requirements of changing conditions, and movable to allow easy relocation whenever necessary. The prime requisite was the ability to dig and deliver maximum yardage with minimum shifting at minimum cost.

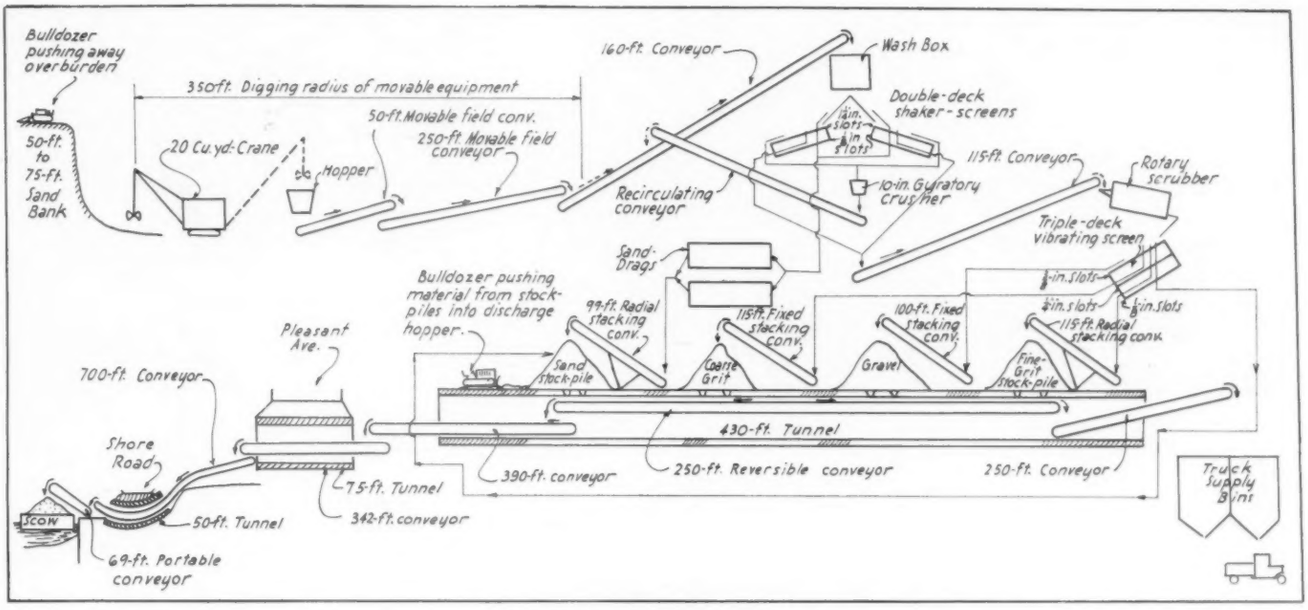
Certainly the sand pit has material of a quality well worth working. The deposit is of glacial origin, the sand is sharp and clean, quite different from some water-deposited bank sands which are too frequently composed of rounded particles intermixed with silt. Too, it is almost entirely free of bowlders, the largest rock inclusions being seldom more than 6 inches in diameter. These comprise less than 0.1 per cent. of the excavated material. providing an easy job for an elderly laborer to pick them off one of the feed conveyors and drop them at one side.

Crane loading 8-cubic yard feed hopper in the deposit.

The overburden was shallow, consisting more of grass and tree roots than of organic top soil, and its removal involved scraping to a depth of hardly more than 6 inches.

The washing and sizing plant and the providing of intermediate storage for the various sizes after they had passed through the plant offered no great problems except those of location. Standardized equipment promised to be (and is) entirely satisfactory for cleaning and sizing and the floor of the sand pit offered a suitable resting place for the proposed stock-piles. Slightly unusual methods, however, were decided upon in connection with the handling of these stored materials, as will be described later.

The chief problems, therefore, involved distance, the crossing of public highways, and dependable, economical excavation. That they have been solved in a desirable manner is due almost entirely to the ability and foresight of W. J. McLain, general superintendent of the McDonald company. Thoroughly experienced in sand-pit opertation, Mr. McLain, although a competent engineer, has a disconcerting way of dispensing with technical formalities. As a result, this plant, de-




Graphic flow-sheet of operations.

signed, according to Mr. McLain, on the backs of old envelopes, represents several departures from accepted practice, but it was economical to build and it works smoothly and efficiently.

The shallow overburden is scraped off with Bucyrus-Erie bulldozers mounted on TD-40 International tractors. There is so little overburden that one day's scraping clears off enough top-of-bank area for more than a week's excavation at the foot of the bank.

A 37-B Bucyrus-Erie crane with a 45-foot boom does all the excavating. Supposed, theoretically, to be equipped with a 1¾-cubic yard bucket, this crane operates with a 2¼-cubic yard clam-shell. Mr. McLain's idea in this was that, since the digging is not heavy and the dry sand does not pile up high in the bucket, he could safely buy a conservatively rated crane of 1¾-cubic yard bucket capacity and take advantage of some of the built-in factor of safety by using a larger bucket. The 37-B has never broken down, even after a year's continuous production of 2,500 cubic yards per day, more than 300 per hour.

The crane was originally equipped with ⅞-inch standard wire rope for the closing line, but more than 150 bucket-loads per hour wore out nearly one line a week. After a few repetitions of such shut-downs, Mr. McLain, finding the drum and sheaves still in good shape and of the proper size, decided that he would experiment with a different type of closing line, before any damage was done to the crane, but chiefly to eliminate shut-downs.

After a few trials of different makes of ⅞-inch standard wire rope, he came to the conclusion that what was needed was not greater strength but greater fatigue resistance and flexibility. A ¾-inch standard wire rope was then tried, but was also found unsatisfactory. So he decided to take a little gamble on ¾-inch preformed wire rope at a few cents more per foot.

Looking down the 700-foot conveyor toward Shore Road tunnel.

The crane operator and his helper were the first to comment on the preformed rope. They said it was easier and quicker to handle and install. The real test was in the digging, and here the ¾-inch 6 × 19 preformed rope with independent wire center lasted more than a month in closing-line service, compared with only a little more than a week for regular-lay rope. The continual punishment of clam-shell work, particularly with an oversized bucket, the constant shifting of tension from the holding to the closing line, never seemed to bother the preformed rope. It gave—and its successors are giving—completely satisfactory results. So that problem was solved, because the rope manufacturer preformed the rope at the mill, relieving it of internal torsional stresses and giving it high fatigue resistance. The rope is Monitor preformed Excellay.

The effective digging radius of the crane plus the movable conveyor belts —one 50 feet long, the other 250 feet long—is about 350 feet or more, figuring the receiving end of the 160-foot fixed feed conveyor as a center point. With the crane boom at approximately a 45-degree angle, the 2½-cubic yard clam-shell bucket swings around a 74-foot diameter circle, picking up the material at the base of the sand bank and dropping it into an 8-cubic yard movable Iowa Manufacturing Company hopper which, in turn, feeds a 50-foot movable field conveyor by means of a 36-inch plate-feeder belt.

This 50-foot conveyor, equipped with a 30-inch belt running 425 feet per minute on Jeffrey idlers and head and tail assemblies, was designed and built by Mr. McLain. The belt is 5-ply, 28-ounce duck with a ⅛-inch rubber top and a 1/32-inch rubber bottom. This conveyor can be moved to dump at any point along the entire length of a 250-foot movable field conveyor with similar belt, idlers, head and tail assemblies and speed, also designed and built by Mr. McLain. It is from this 250-foot conveyor that the occasional larger stones are picked by hand by the elderly laborer with the easy job.

The 250-foot field conveyor discharges on the lower end of a 160-foot inclined conveyor which carries the material up to a wash-box, the first step in the cleaning and sizing operations. The belt, idlers, head and tail assem-

Crane with 15-foot boom extension erecting truck-supply bins.

Portable belt-conveyor loading material to scow. Head assembly of the 700-foot fixed feed conveyor may be seen at the right.

Looking down 100-foot stacking conveyor towards screening plant.

blies and speed of the 160-foot conveyor are the same as those of the two preceding conveyors.

Incidentally, since the crane has a 74-foot swing diameter, which corresponds to a 74-foot working radius from the center of the 8-cubic yard hopper, it is necessary to move the 50-foot movable field conveyor only once every seven or eight days. The crane can, in other words, pick up 17,500 cubic yards (and more) with one set-up of the 50-foot conveyor. When that particular set-up has served its purpose, the crane simply picks up the hopper and the conveyor and relocates them for the next set-up.

Moving of the 250-foot movable conveyor is not quite so easy for one crane to handle, so a 34-B Bucyrus-Erie crane, (with a 50-foot boom and a 1¼-cubic yard clam-shell bucket), is called over at 2-month intervals to help with the lifting. The 34-B crane is also equipped with a ¾-inch 6 × 19 preformed wire-rope closing line, even though this crane is used only occasionally for general utility work around the sand pit.

As mentioned in a preceding paragraph, the washing and sizing of the material starts when the 160-foot inclined conveyor discharges it into a wash-box. This wash-box is equipped with a high-pressure water jet. From here the material flows to two 4- by 12-foot double-deck Kennedy-Van Saun shaker screens.

Material passing over the 1¼-inch slotted-mesh top screens is chuted through a 10-inch diameter Kennedy-Van Saun gyratory crusher to a 20-inch recirculating belt which discharges it on the 160-foot conveyor, the crushed material traveling again to the wash-box.

The material passing through the top screens, but retained on the ⅛-inch slotted-mesh bottom screens, is chuted to a 115-foot Robins inclined conveyor with a 20-inch belt to be graded into gravel, coarse grit and fine grit. The Robins conveyor discharges into an Iowa Manufacturing Company rotary scrubber which, in turn, discharges on a 4- by 12-foot triple-deck Kennedy-Van Saun vibrating screen.

The material passing over the ⅜-inch slotted-mesh top screen is chuted to a 100-foot Robins fixed stacking conveyor with a 20-inch belt and is dropped by this conveyor on the gravel stock-pile.

The material passing through the top screen, but retained on the ¼-inch slotted-mesh center screen, is carried by a 115-foot Robins stacking conveyor with a 20-inch belt to the coarse-grit stock-pile.

The material passing through the center screen, but retained on the ⅛-inch slotted-mesh bottom screen, is carried by a 115-foot Barber-Greene radial stacking conveyor with a 20-inch belt to the fine-grit stock-pile.

The material passing through all three screens is bulldozed to the sand stock-pile.

Now, returning to the two 4- by 12-foot double-deck shaker screens, the material passing through the ⅛-inch slotted-mesh bottom screens is chuted into two Iowa Manufacturing Company 6- by 33-foot sand-drags, which have a speed of 40 feet per minute. These sand-drags discharge on a 99-foot Barber-Greene radial stacking conveyor which carries the material to the sand stock-pile. About 70 per cent. of the material is sand to pass ⅛-inch slotted mesh; 20 per cent. is gravel to pass 1¼-inch slotted mesh and retained on ⅜-inch slotted mesh; 10 per cent. is grits of two sizes—through ⅜-inch slotted mesh and retained on ¼-inch slotted mesh and through ¼-inch slotted mesh and retained on ⅛-inch slotted mesh.

Tractor-bulldozer pushing sand into reclaiming tunnel at stock-piles.

Water for washing is obtained from the bay and pumped up to the plant with an 1,800-g.p.m., 25-horsepower Fairbanks-Morse centrifugal pump. Water discharged from the plant flows into a 10-foot deep, 4-acre sludge pond, from which a 2,500-g.p.m., 75 horsepower Fairbanks-Morse centrifugal pump recirculates it through the plant. The chief purpose of the 1,800-g.p.m. pump down on the bay is to maintain an ample supply of wash-water in the sludge pond.

The stock-pile capacities are: 35,000 cubic yards of sand, 3,000 cubic yards of gravel, 3,000 cubic yards of coarse grits, and 60,000 cubic yards of fine grits. This provides a substantial reservoir of finished material between production and delivery, since at most four 650-cubic yard scows are loaded per day.

Not all the material in the stock-piles is located so that it will flow freely into the discharge holes under them. The free-flowing stock-pile cubic yardage is: sand 6,000, gravel 1,800, fine grits 5,000, and coarse grits 1,800. Mr. McLain figured that the economic life of the sand pit would not justify the erection of huge bins or of such a complete underground conveying system as would tap the entire stock in piles. Instead, he reclaims such stock-pile material as is not free-flowing by simply pushing the sand, gravel and grits over to the discharge holes in the reclaiming tunnel. For this purpose he uses a couple of Bucyrus-Erie bulldozers mounted on TD-40 International tractors and finds them economical.

The conveying of the finished product from the stock-piles to the truck-

View showing some of the conveyor operations. Conveyor A is recirculating material from gyratory crusher to the inclined fixed feed conveyor B.

supply bins in one direction and to the water front in the other direction is done with a McLain-designed system. The problem of providing facilities for the loading of trucks was solved by a 750-cubic yard, 8-compartment truck-supply bin of structural and sheet steel, designed and built by Mr. Lain, all the hoisting being done by the 34-B crane. This bin was built beside a public highway which skirts the eastern edge of the property at a level considerably below that of the pit floor on which the washing and sizing plant is located, and involving no heavy grades for the trucks to climb—a far better location than either Pleasant Avenue or Shore Road.

Beneath the stock-piles runs a 430-foot reinforced-concrete tunnel, in the top of which are holes through which the sand, gravel and grits are allowed to flow (controlled by gates) to a 250-foot reversible horizontal conveyor belt. This belt is 30 inches wide and runs at a speed of 425 feet per minute on Jeffrey idlers and head and tail assemblies. It is 6-ply, 32-ounce duck, with a ⅛-inch thick top rubber and a 1/16-inch thick bottom rubber.

The blending of the various sizes of material to comply with specification requirements is done by controlling the flow through the tunnel gates.

View from Pleasant Avenue tunnel showing transfer point from 342-foot conveyor to the 700-foot conveyor.

When the truck-supply bins are to be filled, the 30-inch reversible conveyor in the tunnel is run to the east, delivering material to a 250-foot conveyor, which extends into the tunnel and which has a 20-inch belt, and carrying the sand, gravel or grits to the top of the bins, whence they are swivel-chuted to the various compartments as desired. This 25-foot conveyor has the same type belt, idlers, etc., as the other 20-inch conveyors.

When scows are to be loaded, the reversible conveyor in the tunnel is run to the west, delivering material to a 390-foot conveyor which extends into the western end of the tunnel and which has a 30-inch belt, idlers and head and tail assemblies like those of the reversible conveyor. The conveying of material to the water front, where scows are loaded, involves the crossing of Pleasant Avenue and Shore Road—another of Mr. McLain's problems.

An overhead crossing of Pleasant Avenue would involve the elevating of material to a considerable height, with a considerably-increased consumption of power, not to mention the frequent need of cleaning material from a public highway. To cross Shore Road overhead would involve no additional elevation of material, but would leave just as much cleaning to be done. In both cases permission for overhead crossings would have been difficult, if not impossible, to get.

Obviously, a tunnel beneath Pleasant Avenue, through the sand ridge, was the answer at that point, but to tunnel under Shore Road was another matter. For Shore Road was only about 6 feet above mean high tide, as previously mentioned, and a tunnel beneath it might easily be flooded by any exceptionally high tide that might gain entrance to it. Mr. McLain decided to tunnel beneath both streets, permission being easily obtainable from the town officials.

The tunnel beneath Pleasant Avenue is of simple, horizontal reinforced-concrete 75 feet long. The one under Shore Road is a 50-foot reinforced-concrete inverted vertical curve, with the eastern and western portals and the bottom (at the portals) about 7 feet above mean high tide. A sump and a pump

View near end of finished-material conveyor. Swinging spout in distance is loading a scow.

Finished-material conveyor emerging from stock-pile tunnel with plant in background. Pump-house and suction-line pipe in center.

Note concrete sidewalls in tunnel underpass at Shore Road.

at the lowest point take care of any ground water that may enter.

The 390-foot conveyor, which takes away material from the western end of the reversible conveyor under the stock-piles, has one inverted vertical curve of 300-foot radius at its approximate mid-point and inclines upward thence westerly to the tunnel beneath Pleasant Avenue. At the eastern portal of this tunnel this conveyor discharges on a 342-foot horizontal conveyor with a 30-inch belt which runs through the tunnel under Pleasant Avenue. Belt, idlers, head and tail assemblies and speed are the same as those of other 30-inch belts.

The westerly end of the 342-foot conveyor discharges through chutes on the upper end of a 700-foot inclined conveyor with a 30-inch belt which carries material down under Shore Road toward the water front. The belt, idlers, head and tail assemblies and speed are the same as those of other 30-inch belts. This conveyor has a sharp vertical curve just east of Shore Road, and an inverted vertical curve of 300-foot radius, tangent to the sharp curve, passes through the U-shaped tunnel under Shore Road. At the westerly end of the gentle inverted curve through the tunnel a 150-foot tangent slopes gently upward to a height of about 10 feet at the top face of the head-assembly pulley on the discharge end.

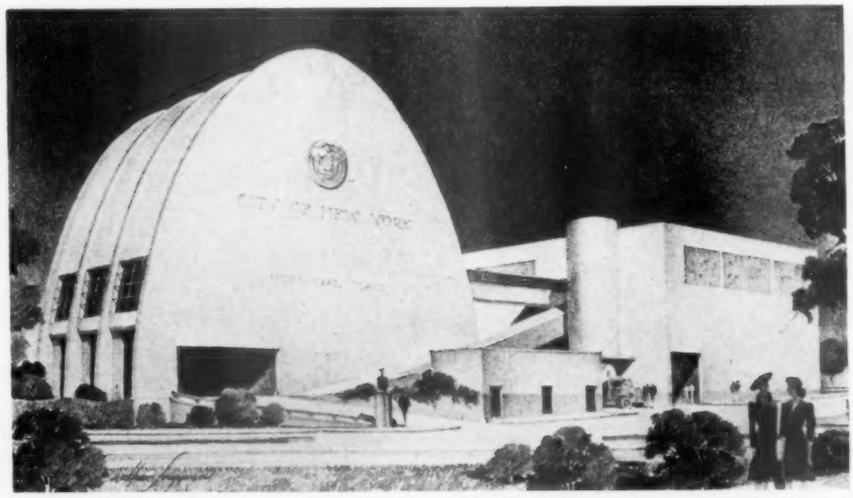
The 700-foot conveyor discharges on a 69-foot portable Barber-Greene conveyor which has a similar 30-inch belt and which is used as a stacker to load scows moored to the bulkhead. A hopper and swivel chute at the discharge end of this conveyor distribute material crosswise on the scows, while a Jeffrey electric winch warps the scows along the bulkhead to provide for lengthwise distribution.

Electric power for the entire operation, except, of course, the cranes and tractor-bulldozers, is 440-volt, 3-phase, 60-cycle, purchased from the local power company.

This North Shore sand-and-gravel plant employs 40 men under C. W. Effinger, superintendent, with Frank Mullins as office manager and Ralph Daum as sand tester. William P. McDonald is president of the William P. McDonald Construction Company. T. F. Spillane is treasurer and W. J. McLain is general superintendent.

The sand pit described is only one of the numerous activities of the parent company, which does a large amount of highway construction, including the building and maintenance of the roadways at the New York World's Fair. The McDonald organization, founded in 1912, is constantly busy with city paving work and operates Macasphalt Corporation of America, a wholly-owned subsidiary, for the manufacture of bituminous paving material for its own use and that of other paving contractors. Another sand pit, owned and operated by the McDonald organization, is located at Port Jefferson, Long Island, about 40 miles east of Port Washington, and is also under the supervision of Mr. McLain. It was at this pit that he obtained much of the experience which he put into practice at the North Shore plant.

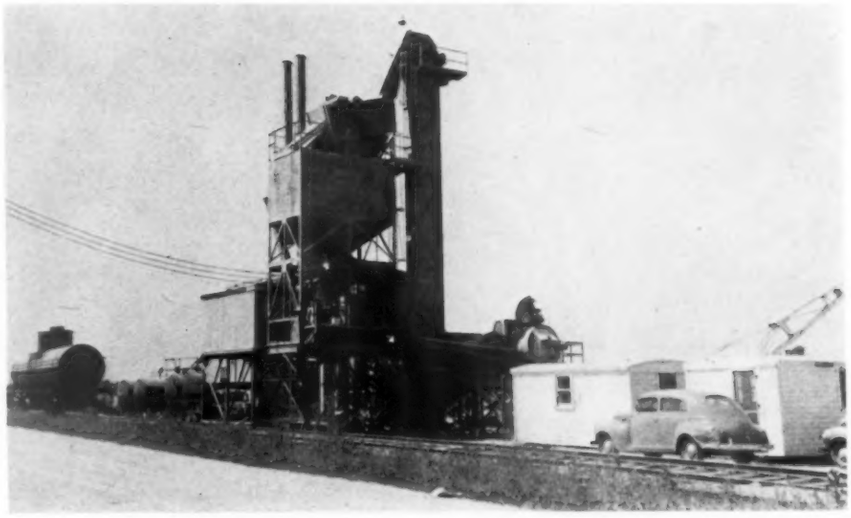
## Monolithic Concrete Plant Structure



Industrial structures need not be ugly as the above rendering of the new municipal asphalt plant of the city of New York shows. It was designed by Ely Jacques Kahn, New York architect, from plans drafted by city engineers. The structure will be concrete throughout. Conveyor belts running in tunnels under the East River Drive in the foreground will bring aggregates from river barges to storage bins in the structure.

# New Hot-Mix Bituminized-Aggregate Plant Has Automatic Control System

A FEW years ago Ralph Bowsman of Piqua, Ohio, was in the business of producing sand and gravel on a relatively small scale. He still produces these materials, but in much larger quantities than formerly, the modern plants of the Bowsman Washed Sand & Gravel Company turning out 25,000 tons annually at Piqua and 100,000 tons a year at Troy. In addition, a subsidiary, the Miami Ready Mix Concrete Company operates a fleet of Smith and Jaeger truck-mixers serving both Troy, Piqua and much of Miami County, while another subsidiary, the Miami Bituminous Materials Company, began operations with a bituminized-aggregates plant at Troy about two years ago. Now a second bituminized-aggregates plant has been erected on the property of the American Aggregates Corporation at Urbana, Ohio. The state has been doing considerable block-top resurfacing and new construction in this vicinity and the two plants have been kept busy supplying the hot-mixed material, hauling it as far distant as 30 miles in insulated trucks as required by the Ohio Highway Department.



The new plant of the Miami Bituminous Materials Company located on the property of the American Aggregates Corporation at Urbana.

**By HARRY F. UTLEY**

The new plant at Urbana is generally similar to the Troy plant except that two oil-fired rotary driers are employed at the new plant, only one, a gas-fired unit, being used at Troy. In addition, numerous refinements have been incorporated in the new Urbana plant making it a remarkably efficient, high-capacity assembly. Both plants were designed and built by Hetherington & Berner, Inc., at its factory in Indianapolis. The Troy plant was described briefly (*P & Q*, November, 1938, page 90) at the time it was erected.

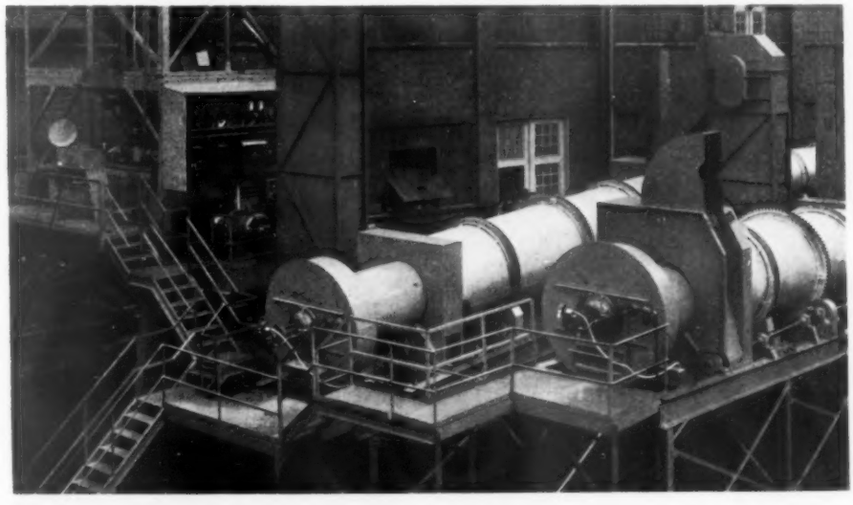
Paul Pennington is superintendent of the new Urbana plant which is located on a railroad spur to accommodate tank-car shipments of bitumen. Washed and graded aggregates are purchased from the American Aggregates Corporation on whose property the plant was built. A P & H clam-shell crane loads them into a 3-compartment steel hopper and they are fed by a 15-inch, 3-plate reciprocating feeder driven through a 3-horsepower Reeves speed-reducer.

A chain-bucket elevator carries the aggregates up to the Number 1 drier. This is 5 feet in diameter and 20 feet long and is of the parallel-flow type, that is, the heat and material travel through the drum in the same direction. It is equipped with self-alining trunnion rollers. This is a new type of design in which a self-alining spherical roll bearing is mounted in the roll and the shaft carrying the roll is stationary, allowing the trunnion roll to follow the contour of the trunnion ring where the ring may be irregular.

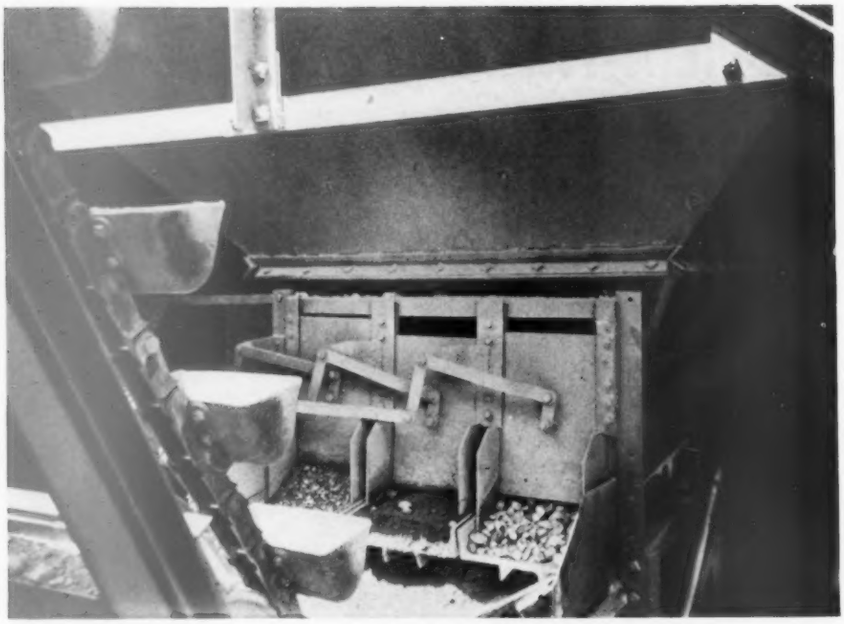
The heating unit is a Ray Super 8 oil-burner. No additional steam or air is required for these burners for atomization and their efficiency is extremely high. This drier and the cold-material elevator are driven by a 30-horsepower General Electric 1,200-r.p.m. motor and reduction is accomplished through a Universal Gear herringbone speed-reducer. The power is transmitted between the motor and the reducer, and between the reducer and the drive-shaft, by Diamond roller-chain couplings.

A Number 45 Sturtevant Planovane exhauster is provided on the Number 1 drier, this unit being driven through V-belts by a 20-horsepower slip-ring motor.

A totally-inclosed cross elevator transfers the hot discharged material from the first drying drum to the Number 2 drier, which is 5 feet in diameter and 24 feet long. This second drier is of the counter-flow type, the heat and material traveling in opposite direc-



Partial view of the plant assembled at the factory showing the two driers. Control equipment may be seen at the left.



The 3-plate reciprocating feeder beneath the aggregate-receiving hopper. Bucket-elevator to drier at left.

tions, and is equipped as is Number 1 except that it is driven by a 40-horsepower motor and is equipped with a Number 50 Planovane exhauster which is driven by a 25-horsepower motor. A Buell dust-collector takes care of the dust drawn from the driers by the exhausters, the unit operating at a reported efficiency of about 96 per cent.

The hot-material elevator is of the same general construction as the cross elevator and is driven by a 15-horsepower geared-head motor through

One of the oil-burners on the driers.

roller chain. It carries the hot, completely-dried aggregates to the top of the plant for sizing by a Deister Machine Company 4- by 8-foot special 4-deck inclosed vibrating screen. The sized material is discharged in a 4-compartment "hot-bin," each compartment having a capacity of about 14 tons. A thermocouple in the sand compartment constantly records the temperature of the material, the usual reading during operation being in the neighborhood of 300 degrees F.

The mixer is a standard Hetherington & Berner Model S-40 unit, capable of mixing 5,000 pounds of standard aggregate at one time. The mixer is equipped with Arzite tips and liner plates and has a steam-operated gate. The sides of the mixer are steam-jacketed and the unit is driven by a 75-horsepower motor through a herringbone reducer. Diamond chain couplings are also used on this drive.

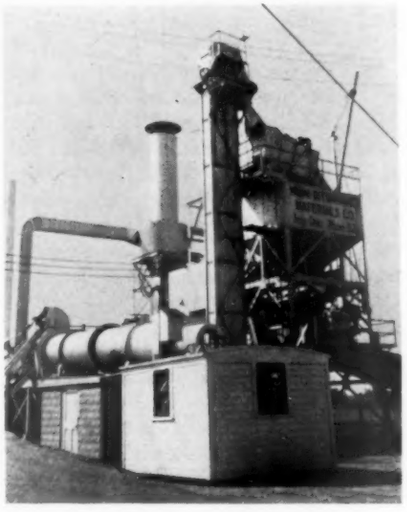
One novel feature of the plant is the hydraulic-control equipment used on the four bin gates and on the aggregate weigh-box gate. This system does away with all manual operating levers as the gates are controlled by valves and cylinders. Vickers equipment is used throughout the control system. The pump, storage tank, valves, filters, etc., are combined in a single unit which is easily accessible on the mixer platform.

The measurement of the bitumen

Crane loading aggregates to the plant.

into the mix is accomplished with a Brayer Fluidometer system. The "heart" of this system is an automatic metering device which eliminates all manual control from this operation. A mercury switch located in the mechanical time-lock on the plant automatically controls the Fluidometer system so that it introduces the correct amount of asphaltic binder into the mixture at the proper time. At the end of this cycle the meter resets itself preparatory to introducing the next batch. Weighing is done with Kron scales.

Three tanks are provided for the storage of bituminous material, two being used for asphalt and one for



The one-drier plant operated by the company at Troy.

asphaltic emulsion. A fourth tank stores fuel oil for firing the driers and the boiler. Steam coils in the bitumen tanks heat the material which is carried to the mixer by Viking pumps, the pipe-lines being insulated.

Another new feature of this plant is the fact that all the electric equipment is mounted on the plant proper. The starters for all the motors are mounted on a panel at the side of the mixer platform which is an integral part of the plant. Using this arrangement it is possible for the mixer operator to start or stop any part of the plant he desires without moving from his post.

## Gravel Pit Idle 47 Years Is Re-Opened

When the railroads were expanding rapidly in the West before the turn of the century, the town of Dawn, Arkansas, was booming because of the large amount of gravel being taken from deposits there. About 1893 the operations were closed and the town all but disappeared.

Now L. W. Hays, Bethany, Missouri, contractor, has leased a site there and is installing equipment for the washing and screening of sand and gravel.

# PERSONAL MENTION

DONALD C. COULSON, recently connected with the Ideal Cement Company, Denver, is now chief engineer for all the plants of the Standard Lime & Stone Company and is located at Martinsburg, West Virginia.

JOHN DRUMMY, formerly assistant sales manager, Volunteer Portland Cement Company, has been made sales manager, succeeding the late Frederick V. Parsons.

FRANK F. PARKER, superintendent of the San Juan Bautista plant of the Pacific Portland Cement Company, has been transferred to one of the company's other plants where he will serve in a similar capacity. He had been connected with the San Juan Bautista plant since it was built in 1918 by the old Mission Portland Cement Company.

CHARLES E. KIETZMAN, formerly chief electrician at the Iola, Kansas plant of the Lehigh Portland Cement Company, has been appointed assistant superintendent of the Dewey, Oklahoma plant of the Dewey Portland Cement Company.

LOUIS J. HOENIG, formerly in charge of sales, has been appointed general manager of the Nebraska Cement Company, Superior, Nebraska.

JOSEPH E. HUFF, salesman for the Limestone Products Corporation since its organization 20 years ago, was pleasantly surprised by fellow employees at his home in Hackettstown, Pennsylvania, recently, the occasion being his 69th birthday. Guests numbered 18 and included EDWARD S. BIXLER, president of the company.

JAMES CAMPBELL HODGE, formerly chief metallurgist of the Babcock & Wilcox Company, has been elected vice-president and a director of the Wellman Engineering Company, Cleveland.

G. D. COBAUGH, formerly representing the Harbison-Walker Refractories Company in the St. Louis area, has been transferred to New Orleans to take the place of the late LEONARD L. VANN who lost his life July 28 while on a fishing trip in the Gulf of Mexico. FRANK WEIR has been transferred to St. Louis from Buffalo where his place is being taken by O. M. GRIFFITH, formerly in the Pittsburgh office.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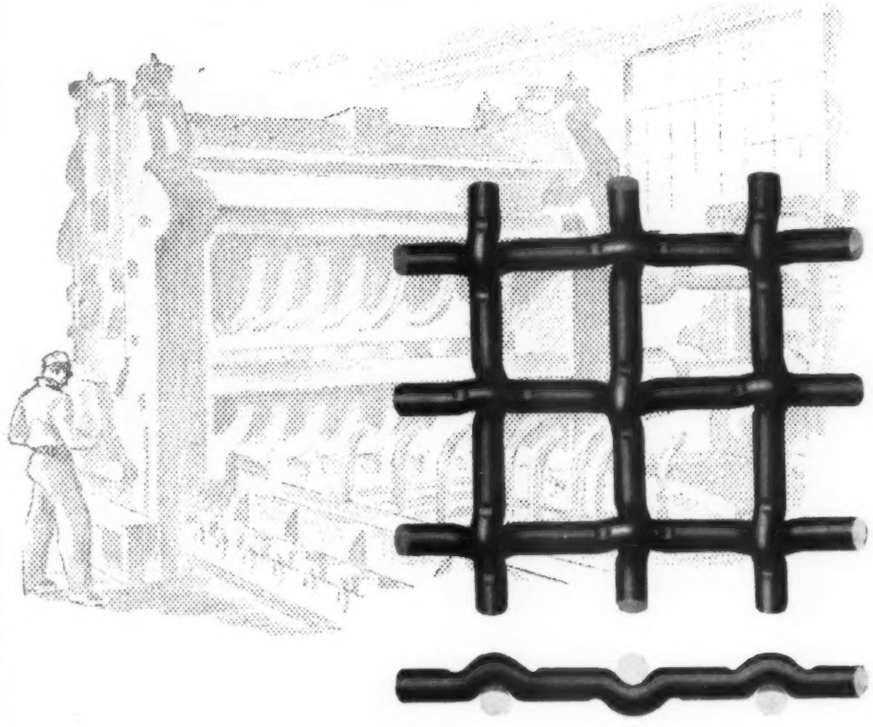

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HOLGER STRUCKMANN, formerly assistant superintendent of the New Orleans plant of the Lone Star Cement Corporation, is now associated with W. R. Bendy, cement engineer, Claverack, New York.

CLYDE E. OWENS, formerly general manager of the American Crushed Rock Company, Delaware, Ohio, is now operating his own plant near Warrensburg, Ohio, the firm name being the Owens Stone Company. He reports enjoying a good volume of business.


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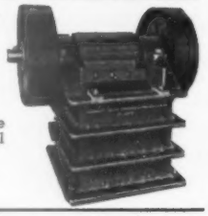

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CECIL HECKERT, who has been storekeeper at the Bonner Springs plant of the Lone Star Cement Corporation, has been transferred to the Wichita office where he will engage in sales work. He has been with the company for ten years.

LOUIS W. BRUCK has established himself at 52 South Audubon Road, Indianapolis, as representative in central Indiana for a group of building-materials concerns.

A. L. BROWN, who has been engaged in the sand-and-gravel business in Virginia, Minnesota, for many years, is adding the manufacture of concrete blocks, having established the Range Concrete Products Company.

A. T. DISHMAN has leased the plant of the Dishman Sand & Gravel Company in Spokane, to JACK E. MARTIN.

FRANK WISEMAN, gravel contractor of Lakota, North Dakota, was instantly killed near Pleasant Lake, N. D., recently when struck by a train.

T. F. CULBERTSON, 68, long employed by the Ash Grove Lime & Portland Cement Company and more recently sales agent for the Trojan Powder Company, died recently at his home in Ash Grove, Missouri. He was a native of Tuscola, Illinois.

RICHARD HAMMERSCHMIDT, president of the Elmhurst-Chicago Stone Company of Elmhurst, Illinois, passed away August 25.

FRANK A. ENZWEILER, 33, was killed recently when the ready-mixed-concrete truck he was driving for the Independent Sand & Gravel Company of Cincinnati and Covington, Kentucky, was struck by a train.

ELIAS T. JENNINGS, 66, veteran kiln superintendent at the Palmyra, Pennsylvania lime plant of H. E. Millard, met his death recently when he slipped and fell into one of the kilns.

JOHN J. MOLIN, 78, who operated a gravel pit and manufactured concrete blocks near St. Paul for more than fifty years, is dead.

CLAUDE A. WEBB, 53, an executive of the Universal Atlas Cement Company, was killed in an automobile accident on August 4 near Madison, Wisconsin. He had been in the cement business in Chicago for 35 years. Surviving are his widow, Dorothy C., and two daughters.

NORMAN MACBETH, 61 vice-president of the Riverside Portland Cement Company, died September 5 at Los Angeles after a brief illness. He was a native of England and an ardent golfer, having held a number of championships in past years.

WALTER C. MARMON, chairman of the board, Marmon-Herrington Company, Inc., Indianapolis, died August 29 at his home.


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# LABOR DECISIONS

## Failure to Reinstate

*National Labor Relations Board v. Federal Bearings Company, Inc., et al.*, decided by the U. S. Circuit Court of Appeals, Second Circuit, February 23, 1940; reported at 109 Fed. (2d) 945.

Because of the failure of the respondent company to reinstate several employees in accordance with an order of the court, it was sought in this action to have the company held in contempt of court. It was shown, however, that two of the men had been convicted of theft, which was unknown to the company at the time it consented to the order of reinstatement. The court holds that the conviction of an employee of the crime of petty larceny, even though the property stolen was not that of the employer, would justify discharging the employee, and is also justification for refusing to reinstate an employee wrongfully discharged under the Wagner act. Failure to reinstate the employees concerned was not a contempt of court.

With respect to another employee, it was found that the position he formerly

held had been abolished, and that he had declined a job in another department at wages at least equal to those he previously received. This action, according to the ruling of the court, terminated the company's duty as to that employee.

## Inside Union

*Link-Belt Company v. National Labor Relations Board,* decided by the U. S. Circuit Court of Appeals, Seventh Circuit, March 2, 1940; reported at 110 Fed. (2d) 506.

An order of the National Labor Relations Board involved in this case directed the company, among other things, to withdraw recognition from and to disestablish an independent union as the representative of the employees of its Chicago plant. The court finds that an Employees Board which functioned before passage of the National Labor Relations Act was completely dissolved and abandoned prior to the recognition of the present independent union; that the company had no voice in the formation and exercised no control in the administration of the union; that it gave no financial aid or assistance; and that there was no evidence that the earlier employees' board had been used as an instrument of domination or that the company imposed its will upon its employees. The court, accordingly, refuses to enforce that part of the Board's order. The court is "unable to find any evidence from which it could be inferred that these employees did not, with complete independence and freedom from domination, interference, or support from the company, form their own union."

The fact that a foreman attended without participating, the first meeting of the union, that another foreman had explained to an employee the advantages of an inside union over an outside union, and similar incidents, are held not to alter the main conclusion. The mere attendance by a foreman at the meeting is not evidence of interference, says the court, and the expression by men of a dislike to organized labor does not indicate that they must be acting for the management. "We cannot believe that what they did, under all the circumstances in this case, can be charged to the company."

Another portion of the order directed the company to cease and desist from engaging in any manner of espionage or surveillance. The evidence showed that over a period of years a lathe operator forwarded to a trade association, which furnished copies to the employer, reports dealing with matters of safety, sanitation, production, and with dissatisfaction voiced by employees relative to piece work rates. The court


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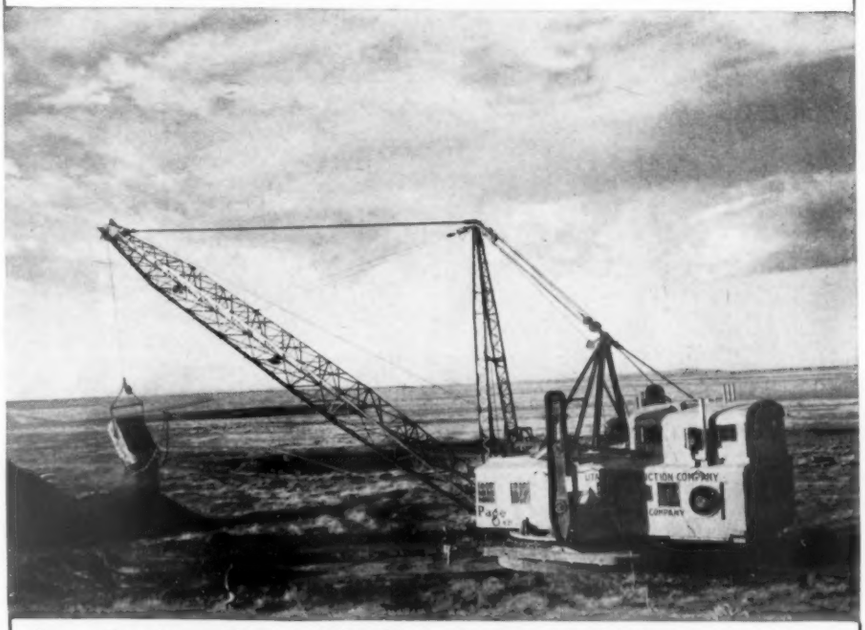

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thinks that "the facts and circumstances in evidence, particularly the secrecy veiling (the employee's) reports, the circuitous routing and the immediate destroying of the reports, furnish substantial basis for the finding that the company has thereby engaged in unfair labor practices," and that portion of the order will be enforced.

Questions involving the reinstatement of various employees alleged to have been discharged or discriminated against for union activities are decided upon the facts involved in each instance.


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## Jurisdiction

*Sanco Piece Dye Works, Inc., v. Herrick,* decided by the U. S. District Court, Southern District of New York, April 8, 1940; reported at 33 Fed. Supp. 80.

The regional director of the National Labor Relations Board called a hearing on charges against the plaintiff company, alleging violations of the National Labor Relations Act, and consolidated the hearing with another hearing involving another dye works. The plaintiff in this action sought to enjoin the director from consolidating the hearing. The relief sought is denied for the reason that the federal district courts have no jurisdiction over the matter. "Congress, by the passing of the National Labor Relations Act, has designed a forum for the hearing and determination of labor disputes with appropriate remedies for appeals to the Circuit Court of Appeals. Congress has not vested in the federal courts concurrent jurisdiction over such matters. The jurisdiction of the labor board is exclusive. It is only when all administrative remedies are exhausted can there be resort to the federal courts."

## Wholesaling

*Wood v. Central Sand & Gravel Company et al.,* decided by the U. S. District Court, Western District of Tennessee, May 3, 1940; reported at 33 Fed. Supp. 40.

This was a suit under the Fair Labor Standards Act of 1938 to recover the difference between plaintiff's wages and the minimum provided in the act, plus a like amount as liquidated damages, and for attorney's fees and costs.

During the period involved, the employer's sales in interstate commerce were 6½ per cent. of total sales, but this was during a period when due to high-water conditions on the Mississippi River many orders ordinarily filled by plants along the river were given to the Central Company. In the period of almost a year preceding the time concerned in the suit, the interstate sales had been only 1/10 of 1 per cent. of the total. The interstate sales of the Fisher Lime & Cement Company, of which the defendant company is a subsidiary, and which is called the "real defendant," amount to 15 to 20 per cent of its total. The court holds that "to accomplish the beneficent purposes of the act, Congress manifestly intended and expected the courts to apply broadly and liberally the coverage of the act to include those engaged in the production of goods, a portion of which were designed for interstate commerce," and that the employer in this case is governed by the act.

It is further held that a night watchman (the employment of the employee in question) is within the coverage of the act.

The company claimed an exemption from the act on the ground that it is a "retail or service establishment the greater part of whose selling or servicing is in intrastate commerce" (Section 13 (a) (2) of the act.). The court holds, however, that although the Fischer company (again called the "real defendant") makes many retail sales, its sales in bulk lots to a state, to the Works Progress Administration, and to contractors, constitute a substantial wholesale business, and that the "retail establishment" exemption does not apply.

[For further details see *P & Q,* June, 1940, page 22 and July, 1940, page 24. —Editor.]

## Minimum Wages

*Reeves v. Howard County Refining Company,* decided by the U. S. district Court, Northern District of Texas, Abilene Division, May 7, 1940; reported at 33 Fed. Supp. 90.

The court "understands the law to be that this act" (the Fair Labor Standards Act of 1938) "is what the name implies, a minimum-wage and hour act, and that parties may contract with reference to hours and compensation at will, provided the compensation to be paid is not less than the scale fixed by the law." In the suits here involved, seeking to recover the difference, doubled, between wages paid and the minimum wages provided in the act, such recovery is allowed only in the case of an employee whose compensation was less than the minimum wage provided in the act for the number of hours worked. In other instances, however, the fact that the hours worked were longer than the hours provided for in the act is held not to permit recovery for overtime when the pay exceeded the minimum time and overtime wages provided by the law. In such case, the workman "having entered into a contract for a stipulated consideration which is in ex-


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cess of the minimum wage fixed by law . . . had a right to make such agreement, and having entered into such agreement, he is bound thereby." Where the agreement provided for compensation less than the minimum in the act, however, there was no binding contract.

## Interference

*Subin et al. v. National Labor Relations Board,* decided by the U. S. Circuit Court of Appeals, Third Circuit, March 12, 1940, rehearing denied May 7, 1940; reported at 112 Fed. (2d) 326.

The employer in this case was found to have "foisted" a shop committee upon its employees, welcoming its formation as an antidote to the activities of an outside union, and to have interfered with and dominated the formation and administration of the shop committee, thereby interfering with and coercing the employees in the exercise of rights of collective bargaining guaranteed by the National Labor Relations Act. The court decrees enforcement of the board's order for the employer to cease and desist from such interference and (with certain modifications) to reinstate with back pay employees found to have been discharged on account of union activities.

It was noted that during the organizing activities the employer threatened to go out of business if the plant were unionized. Whether or not the act prevents an employer from threatening to go out of business in order to influence his employees from joining a union is not decided, but attention is called to a similar situation in *Union Drawn Steel Company and Republic Steel Corporation v. National Labor Relations Board* (3d Circ.), 109 Fed. (2d) 587.

## Air and Encouragement

*National Labor Relations Board v. Lane Cotton Mills Company,* decided by the U. S. Circuit Court of Appeals, May 9, 1940; reported at 111 Fed. (2d) 814.

While an outside union was attempting to organize the workers of the employer concerned in this case, the company stated that it did not want an outside union, and gave "aid and encouragement" to an independent association of its employees. The court, upon a review of the evidence, finds the National Labor Relations Board justified in its finding that the employer interfered with its employees' right of self-organization, and its orders to remedy the situation. The court likewise sustains the board in ordering the reinstatement with back pay of fifty employees discharged for union activities.

## Affiliation

*Magnolia Petroleum Company v. National Labor Relations Board,* decided by the U. S. Circuit Court of Appeals, Fifth Circuit, June 13, 1940; reported at 112 Fed. (2d) 545.

A "Federation" of the petitioning company's employees was disbanded because of objections that it was supported and dominated by the company, and thereafter an independent union, in which many of the same employees participated, was formed. Upon complaint by another union, a local affiliated with the C.I.O., the National Labor Relations Board held that the independent union was dominated by the company, and ordered its disestablishment. In this proceeding the board sought enforcement of its order and the company sought to have the order set aside.

The court points out that "in its capacity as accuser, the board, under the genius of our institutions, is held to the same burdens and obligations of proof as any other litigant who takes the affirmative. It may not by accusing put the accused upon proof. As accuser it must prove its charge. In its capacity as a trier of facts, the board stands on the footing of a jury. Like a jury it must be impartial. Like a jury, it may


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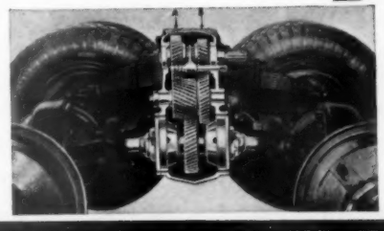

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not make findings without evidence to support them and as in the case of a jury, it is for the courts to say whether there is or is not evidence in support."

In this case "absolutely all that the evidence shows as to the independent is that it was formed by employees, struggling single-handed and alone, to exercise the rights of self-organization the Congress has guaranteed them against the efforts of the affiliated local, sponsored and supported by the board, to compel them to join or be represented by it. The evidence shows that without, as the affiliated local has, a national organization to assist them and obliged to do the best they could on their own, they made an earnest and, in the light of the result, a pitiful effort to enjoy these rights. Harassed and prevented at every turn, by persistent attacks upon them, made by the local and sponsored by the board by means of complaints and charges that their employer had coerced or bought them into forming and joining the union they seek to form, the employees in the independent are by the findings and order complained of, presented the Hobson's choice of joining the affiliated local or going without self-organization, and this upon a record wholly devoid of evidence at all supporting the charges."

The court rules that the employees have a right to form their own union with complete independence and freedom from domination from the employer, and that the findings in this case were based on "nothing but suspicion, surmise and conjecture." The board's order accordingly is set aside.

## TRAFFIC NEWS DIGEST

*Limestone Relief.*—Relief from the long-and-short haul part of the fourth section in establishing a rate no lower than $1.79 a long ton on limestone, crude, fluxing, foundry and furnace, carloads from points in Maryland, Pennsylvania, Virginia and West Virginia, to Buffalo, Harriet and Lackawanna, New York, has been given railroads by the Commission, division 2. This relief applied for in fourth section application No. 18101, Limestone to Buffalo, Harriet, and Lackawanna, New York.

The railroads are authorized by fourth section order No. 13910 to establish and maintain a rate over their circuitous routes, on the commodity when loaded in bulk in open-top equipment, carload minimum weight 90 per cent. of the marked capacity of car, except that when car is loaded to cubical or visible capacity, actual weight will apply, from Bellefonte, Bittinger, Howard, Naginey, Pleasant Gap, Shainline, Thomasville and York, Pennsylvania, Grove, Maryland, Capon Road, Stephens City and Strasburg Junction, Virginia, and Engle, Inwood, and Martinsburg, West Virginia, to the points mentioned, the same as that contemporaneously in effect over their direct routes from and to the same points but not lower than $1.79.

The rates to higher rated intermediate points are not to exceed rates constructed on the basis prescribed in American Lime & Stone Company *vs.* Pennsylvania, 201 I.C.C. 467, plus increases authorized in 1937-38, and in no case exceed the lowest combination of rates subject to the Interstate Commerce Act. The relief is not to apply to rates over any route over which the distance from origin to destination exceeded 400 miles, or to any line or route more than 50 per cent. longer than the short tariff route between the same points.

The application was supported by the Standard Lime & Stone Company, an intervener, operating limestone quarries at Martinsburg, Engle, Millville and Capon Road. It was stated in the report that the intervener considered the Buffalo district a potential outlet for its fluxing stone and that the establishment of the $1.79 rate will afford an opportunity to meet the competition of the limestone which moves by water to the Buffalo district.

*Limestone Reparation*—The Commission, by Division 2, on further hearing in second supplemental report in No. 24757, Limestone Products Corporation of America *vs.* Lehigh and Hudson River Railroad Co. et al. has awarded the complainant reparation plus 6% interest. This reparation was determined from findings made in prior reports, 201 I.C.C. 467, 220 I.C.C. 311, that rates on pulverized limestone, carloads, from Lime Crest, N. J., to destinations in New England territory were unreasonable. The Lehigh and Hudson River Railroad and the New York New Haven and Hartford Railroad was directed to pay the reparation with interest from the dates on which the freight charges were paid, to the complainant on or before October 17.

*Rates on Whiting*—The Commission on further hearing in No. 27921, Southwark Manufacturing Company *vs.* Pennsylvania-Reading Seashore Lines *et al.*, and many cases joined with it, has ordered the railroads to make rates on chalk whiting not exceeding 20 per cent of first-class rates from Camden, N. J., to destination in official territory, not later than October 25. This hearing was held in an effort to dispose of controversies over rates on chalk whiting and limestone whiting, also called whiting substitute. The Commission also required of them to make rate on that commodity from Camden to points in southern territory which shall not exceed the percentage of the first-class rates maintained on limestone whiting or whiting substitute, from York and Rambo, Pa., to the same destinations, 60,000 pounds to be the minimum in each instance.

The Commission reopened No. 25220, American Lime & Stone Company, *et al. vs.* Pennsylvania *et al.*, and the cases joined with it, 201 I.C.C. 467 so as to make a foundation for the new basis. The Commission modified the findings therein so far as they related to rates on finely ground and pulverized limestone which is known and used as whiting or whiting substitute. The various cases on whiting were written by Commissioner Mahaffie. These cases grew out of the complaint of the Southwark Manufacturing Company, that the rates charged on its product chalk whiting, from Camden to destinations in official and southern territories were unreasonable, unjustly discriminatory, unduly prejudicial to it and unduly preferential of its competitors who shipped ground limestone, sometimes known as limestone whiting or whiting substitute. Lawful rates for the future were sought. Sixteen sub-numbers were filed by consignees receiving shipments from the Southwark Company who asked for lawful rates for the future and reparation. Various shippers, manufacturers, and users of ground limestone intervened. Commissioner Mahaffie said they stated they were not opposed to any reduction

that might be justified in the rates on chalk whiting, but denied there was competition between chalk whiting and ground limestone or other transportation of traffic conditions that warranted the prescription of a common level rate on the two articles.

The report shows that the controversy as to rates on the two sorts of whiting was an outgrowth of World War I. During the period from 1915 to 1920 it was difficult for users to obtain chalk from England and France. At that time the Commissioner said it was discovered that certain domestic limestones when ground to a sufficient degree of fineness could be substituted for chalk whiting. However, ground limestone had been taking very low rates because of its use for fertilizer as well as other things.

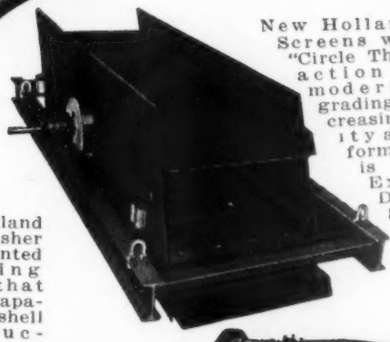
The situation was made more complex by a thirteenth section proceeding involving New Jersey interstate rates, which brought up the question of what basis of rates could be applied on the two sorts of whiting. The report said the findings in the prior report contemplated that the same level of rates would be maintained on chalk whiting and on limestone whiting both interstate and intrastate within New Jersey.

The report stated the rates on chalk whiting were reduced on June 15, 1939, to 20 per cent. of the first-class rates, minimum 60,000 pounds, interstate and intrastate in New Jersey. However, the rates on limestone whiting were not changed. The carriers explained, on brief, that this was not because they thought column 20 or even column 25 would be too high in and of itself but, rather, because certain railroads were impressed with the assertions of some shippers and consumers that the traffic would go to the motor trucks, should the rates be increased. Consequently, the railroads said they hesitated to give their consent to an increase on the limestone whiting rates. It was suggested by the railroads that the Commission should not do anything in connection with these rates which might rob them of their managerial discretion in fixing their rates so as to meet competing forms of transportation. They argued that if a section order were issued by the Commission compelling a fixed relationship of rates on chalk whiting and limestone whiting, it would be impossible to reduce a rate on one commodity to meet the competition of another transportation agency without likewise reducing the rates on the other commodity where such competition might not exist. In disposing of the matter the Commission said, on reconsideration, in the light of the further hearing it affirmed prior findings.

*Motor-Carrier Classification*—The American Trucking Association Incorporated has urged the Commission to apply a carrier classification to all property certificates and permits issued or to be issued by the Commission under the motor carrier act. This recommendation was made by the association in a petition filed in Ex Parte MC 10, classification of carriers.

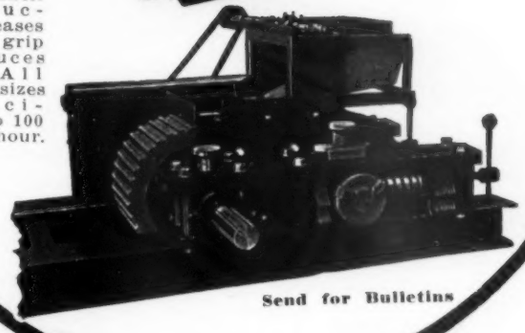
The association said that from the inception of its carrier classification committee it had strongly urged the Commission to use a classification of carriers when issuing certificates and permits, and that it had conferred with division 5 in regard to this matter. It said further that the Commission had recognized he importance of classification as authorized in section 204 (c) of the act by assigning members of its staff to work on the subject and by the issuance of its orders in Ex Parte MC 10, 2 M.C.C. 703, although it had not employed the classification which it adopted in Ex Parte MC 10. The association has asked that the Commission modify its order in Ex Parte MC 10 wherever necessary to fit the facts which have been developed since its promulgation.


NEW HOLLAND



New Holland Screens with "Circle Throw" action have modernized grading by increasing capacity and uniformity. Above is shown the Extra Heavy Duty Vibrating Screen, available in full range of sizes —one to three decks.

New Holland Roll Crusher has patented pulsating feeder that doubles capacity. Rib shell construction increases angle of grip and reduces dust. All standard sizes —capacities up to 100 tons per hour.



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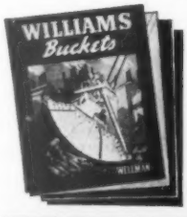
New Holland Pennsylvania



JOBS DON'T COME TOUGHER THAN THIS ONE!

● This Williams ½ Yard Multiple Rope Bucket took plenty of punishment on this job—tearing out the massive stone and concrete foundations of the old Baldwin Locomotive Works in Philadelphia.

● The digging power in Williams design and the rugged durability of their welded rolled steel construction make Williams Buckets profit producers for contractors everywhere.

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Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service

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# SIMPLICITY

GYRATING SCREENS have made a remarkable record of real service when compared with competitive equipment under actual operating conditions.

The Ohio Marble Company operated Simplicity Screens together with others for many years, so they obtained comparable results. Based on these results, they purchased Simplicity Gyrating Screens for their new modern plant.

You too, can have capacity, efficiency and low operating costs by installing Simplicity Screens.

**Simplicity**
**ENGINEERING COMPANY**
**DURAND, MICHIGAN**


*Fourth Section, Application No. 18215*—Cement from Chattanooga to Kentucky. By division 2. Nashville, Chattanooga & St. Louis and Louisville & Nashville authorized by fourth section order No. 12931 to establish and maintain on cement, carloads, over the route from Chattanooga and Wauhatchie, Tenn., Hooker, Georgia, Etna, Whiteside and Ladds, Tennessee, to Lexington and Midway, Kentucky, by way of the N.C. & St. L. to Nashville, and the L. & N. beyond, rate the same as those contemporaneously in effect over direct lines or routes from and to the same points, constructed on the same basis prescribed or approved in Southern Cement Rates, 132 I.C.C. 427, 139 I.C.C. 484, 147 I.C.C. 303, 155 I.C.C. 339, and 188 I.C.C. 602, increased as authorized in 1938, but not less than 17 cents a hundred pounds, without observing the long-and-short-haul part of the fourth section. Temporary relief was authorized by fourth section order No. 13711.

*Fourth Section, Application No. 18604*—Fi'ed by B. T. Jones requesting fourth section relief to establish rates on lime, carloads, from points in central territory to points in western trunk line zone C territory to meet competition.

*Fourth Section, Application No. 18640*—Filed by the ACL requesting fourth section relief to establish rates on stone, crushed, or rubble, carloads, from Boxley, Virginia, to the U. S. Naval Air Station, Sewells Point, Virginia. Circuitous routes and water competition being the grounds for relief.

## Trade Literature

*New Holland Roll Crushers.* (16 pages) New Holland Machine Company, New Holland, Pennsylvania.

*Fan Systems for Various Industries.* (24 pages) The Kirk & Blum Manufacturing Company, Cincinnati.

*Hassell Mining Equipment.* (12 pages) Hassell Engineering Company, Colorado Springs.

*Extra Capacity Carryalls.* (8 pages) R. G. Le Tourneau, Inc., Peoria, Illinois.

*Hardinge Products.* (folder) Hardinge Company, York, Pennsylvania.

*Raymond Imp Pulverizer—the Mill of Many Uses.* (4 pages) Raymond Pulverizer Division, Combustion Engineering Company, Chicago.

*Texrope Drives.* (16 pages); *Single-Stage Turbo Blowers.* (24 pages) Allis-Chalmers Manufacturing Company, Milwaukee.

*Telsmith Jaw and Roll Crushers.* (12 pages) Smith Engineering Works, Milwaukee.

*Multi-V-Drive Master Manual.* (72 pages) Worthington Pump & Machinery Corporation, Harrison, New Jersey.

*Air Circuit Breaker Switchgear.* (8 pages) Roller-Smith Company, Bethlehem, Pennsylvania.

*The New Rex Moto-Mixers.* (folder) Chain Belt Company, Milwaukee.

*Hot or Cold Mix Asphalt Plant, Model C.* (4 pages) Iowa Manufacturing Company, Cedar Rapids.

*Cost Finding Record for Conveyor Belts.* (24 pages) B. F. Goodrich Company, Akron.

An effective brochure entitled "Candid Sap-Shots . . . of a Salesman Who Got 'Took'" should be of interest to sales executives. Complimentary copies may be had by writing Belnap & Thompson, Inc., Chicago.

# NEW MACHINERY AND SUPPLIES

## • Welder

The latest addition to the line of welders manufactured by the Harnischfeger Corporation of Milwaukee is the P&H-Hansen WD-150, an arc welder measuring less than 33 inches in length and one foot in height, and delivering currents ranging from 200 down to 15 amperes.

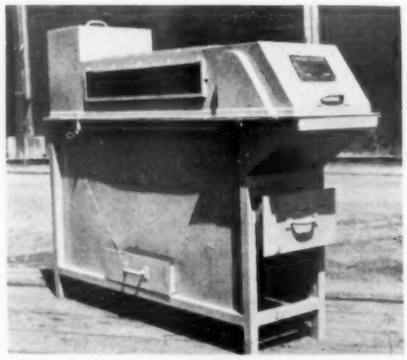
Current selection is simplified on this machine by the use of a single control. Once the current setting has been made the generator automatically responds with the desired arc

Welder of square-frame design.

length under all welding conditions. Mis-synchronization of open circuit and arc voltage is impossible because of the welder's automatic volt-ampere regulation, self-excitation, and internal current stabilization.

A significant departure from conventional welder construction is the WD-150's square-frame design. There are numerous advantages to this design. First, it makes for an over-all compactness which means more machine in less space. Secondly, the shape of the machine permits a more efficient arrangement of coils, etc., which results in a better magnetic balance and greater cooling areas of the coils.

But perhaps the most outstanding feature of the WD-150's square-frame design is the paralelling arrangement it allows. With this parallel hook-up, an operator can stack two or



**An 11- by 36-inch single-deck Symons screen with combination stand, casing and bins all forming a part of the screening unit, built by The Nordberg Manufacturing Company for the mining school of a large university for laboratory purposes and as a small sampling plant. Note that drawers have been provided for catching the screened size and the oversize and the cover is provided with glass windows for observing the screening operation.**

more machines one above the other, connect them together, and have at his disposal the aggregate current of all the machines for peak loads.

The single-control feature of the single unit WD-150 is carried over to the combined machine hook-up through a "multiple shifter" device which is attached to the selector of each machine. Thus, when the "multiple shifter" is set for any given current, all the machines in the hook-up are set for that amperage.

When the machines are to be operated as separate units, the wing nut on the connecting rod of the "multiple shifter" is loosened, disengaging the rod and allowing individual current settings to be made on each machine.

## • Thickener

A new and radical design of thickener mechanism, known as the Auto-Raise thickener, has just been announced by the Hardinge Company, York, Pennsylvania.

The one big unpredictable cause of trouble with a thickener or clarifier is the sudden overloading of the rakes at the bottom of the tank, due to some foreign material, like a bar or wrench dropped into the tank or solids that have built up on the sides of the tank or top of the mechanism, giving way and dropping to the bottom. Overload alarms and means of stopping the thickener have been employed for years, but even with these devices, many a thickener has twisted off its shaft, broken its gears or dislodged the mechanism entirely. The Auto-Raise principle automatically relieves the thickener of an overload in the tank, no matter whether the overload is at the periphery or in the center. Important features of this new driving mechanism:

1. Rollers on scraper shaft are driven by a rotating diagonally slotted tube. Excess pressure against scrapers causes rollers to move up incline, raising shaft and scrapers.

2. Cover plate over inspection opening.

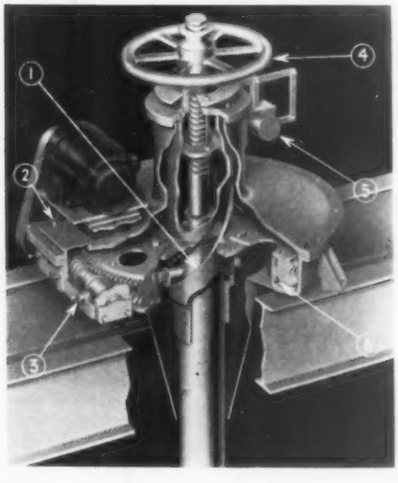
3. Heavy adjusting set screws for quick and accurate alignment of worm shaft.

4. Manual raising wheel operates independently of "Auto-Raise" device.

5. Overload alarm and power cut-off switch operates when scrapers are raised near maximum position.

6. Ball bearings in oil-filled casing support entire rotating mechanism and scrapers.

The mechanism and complete thickener has passed the development stage, as units are now in operation in the United States, Canada, South America and Europe, handling very coarse, very fine and extremely heavy solids. It is believed that this principle offers a dis-




Driving mechanism of the thickener. Refer to text above for numbered features.


SCHRAMM AIR COMPRESSORS

2 SCHRAMM 315 cu. ft. Diesel Driven "Utility" Compressors operating 2 CLEVELAND Wagon Drills. Holes are 12 ft. deep, on 6 ft. centers and 1,000 to 1,200 cu. yds. of rock are being removed per day.

SCHRAMM "UTILITY" DIESEL DRIVEN COMPRESSOR WITH WAGON DRILL THE FASTEST KNOWN ROCK DRILLING METHOD

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STOP THE EPIDEMIC OF BURN-OUTS WITH... PYRASTEEL Kiln Ends

Kiln Ends have a way of burning out most unexpectedly. Such accidents are not only frequent and widespread but costly.
Operators suffer heavy losses from shutdowns, repairs and crippled production . . . *except* in mills that have installed PYRASTEEL Kiln Ends.
These last for years, instead of months or weeks. They pay dividends in extra economies by saving fuel, reducing maintenance, and insuring uninterrupted kiln output.

Segments easy to assemble or replace.

Write for Bulletin on this Heat-Resisting Alloy

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PYRASTEEL for high temperatures
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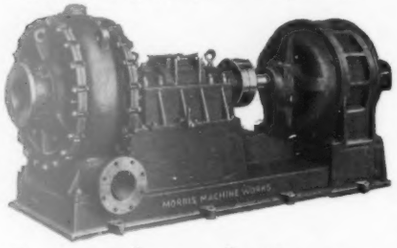
## Hydraulic Dredges

that increase sand and gravel production and reduce operating and maintenance costs. Every type, size, and method of drive.



## Centrifugal Pumps

Ten different designs for handling sand, gravel, cement slurry, and other abrasives, and a type for every clear water service

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**Export Office: 30 Church St., New York City**

**TRI-VIBE . . . a feature of only LEAHY Type "C" No-Blind Vibrating Screens . . . puts *plenty* of dynamic energy into every square inch of the screen cloth. Better results in fine mesh screening: Extra capacity, constant uniformity, 90% to 97% efficiency rating and only ½ HP for full load operation.**

**The Deister Concentrator Company**
The Original Deister Concentrator Co.
Est. 1906
**911 Glasgow Ave., Fort Wayne, Ind.**


tinct advance in the art of thickening and ability to keep the thickener running, regardless of local conditions.

Bulletin No. 31-C, just published, describes this thickener, as well as other types of thickeners, clarifiers and agitators made by the Hardinge Company, Incorporated.

## • Coating for Stone

For coating wet and so-called "difficult" stones with asphalt or other bitumens, the Asphalt Treatment Corporation reports considerable success with its new product, "Kotal," which is now being marketed commercially after a long period of development.

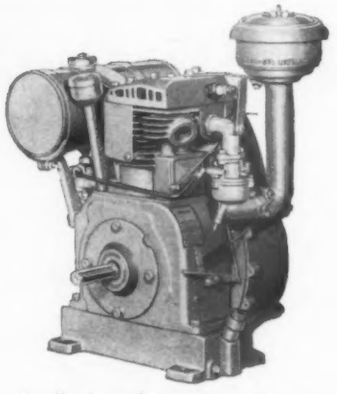
Kotal is used in conjunction with quicklime in the mixture and the usual drying of the aggregate can then be eliminated, the concern claims.

Stock-piles of aggregates treated with Kotal and quicklime only may remain exposed to the weather for months and, wet or dry, will still coat rapidly with regular cutback asphalts.

Complete information, together with technical and engineering data, may be obtained by writing the Asphalt Treatment Corporation, 140 Cedar Street, New York City.

## • Gasoline Engine

The Briggs & Stratton Corporation, Milwaukee, has announced a new 4-cycle, 6 horsepower, air-cooled gasoline engine, known as Model ZZ. Ignition is supplied by a specially designed dust and moisture-proof high tension flywheel magneto. Other standard equipment includes: Silchrome exhaust valve with alloy steel inserted seat, inserted Molybdenum alloy valve guides, specially designed float feed type carburetor, adjustable mechanical governor, drop-forged counter-weighted crankshaft, aluminum alloy pistons and connecting rods, pump and splash lubricating system, gasoline filter, oil-bath air cleaner, screened blower housing, and many other features.



Small, air-cooled gasoline engine.

The unit is recommended for use in driving pumps, hoists, generators, mixing equipment and for other general utility purposes. Detailed specifications may be had upon request to manufacturer.

## • Lift-Truck

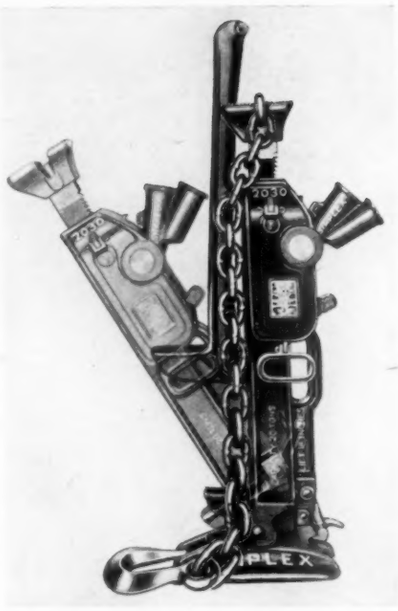
The Elwell-Parker Electric Company, Cleveland, has brought out a new type of fork truck, capable of elevating loads on skids or pallets to three levels instead of one.

The elevating mechanism is built in three telescoping sections. When uprights are completely lowered, the forks just clear the floor. At the operator's will, forks can be raised to 50½ inches on the first lift, to 88½ inches on the second, and to 112 inches on the third. The rate of upward travel is 20 feet per minute with a 1,500 pound load.

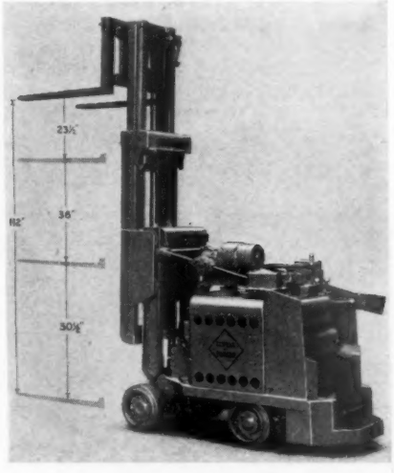
With telescoping members lowered, the overall height of the truck is but 74 inches. Thus the loaded truck can pass through doorways or beneath low overhanging pipes or conveyor systems.

The main driving motor is an Elwell-Parker 4-pole, series wound, capable of sustaining a 500-per cent. overload. It is direct-connected to a free-coasting worm and gear, and drives the two wheels nearest load, assuring ample traction. Power source can be either acid or akaline storage batteries. No fuses are needed to protect motor. When lowering the load, regenerated power is returned to the battery.

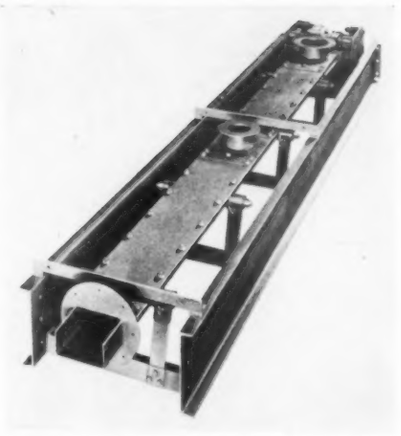
The hoist is operated by a separate motor controlled by push-button. It may be tilted 15 degrees backward or 5 degrees forward from vertical.



**To meet the need for an emergency jack for use in the heavy industries, Templeton, Kenly & Company, Chicago, has introduced the model pictured above. It has a full 20-ton lifting and holding capacity on either the cap or toe lift of the jack.**




Power-driven lift truck.



An improved conveyor of the vibrating type featuring totally-inclosed design, minimum headroom, and rubber-shackled pan mounting with self-contained, patented, reciprocating drive recently announced by the Ajax Flexible Coupling Company of Westfield, New York. The conveyor illustrated is equipped with two intakes and a single discharge.

## • Pump

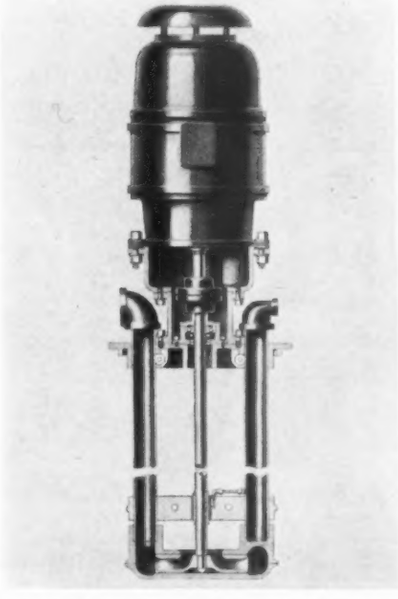
The American Manganese Steel Division of the American Brake Shoe & Foundry Company, Chicago Heights, Illinois, has announced the addition of new designs to their already broad line of centrifugal pumps.

To supplement their long-established production of dredging and material handling pumps, engineers of the organization have developed new designs based on proved hydraulic practices that they believe will interest industrial pump users generally.

A complete line will ultimately be available of Amsco-Nagle vertical and horizontal centrifugal pumps for handling all types of abrasive mixtures and corrosive liquids.

At this time Amsco is in production on five different new designs, two of which, the Types "A" and "T" are horizontal pumps, available in all sizes from ¾ to 6 inches.

A sectional view of the Type "SW" of the



Newly-designed vertical centrifugal pump.

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Get the low belt cost per ton that Cincinnati Conveyor Belts give . . . get the tonnage carrying power . . . the extra years of service . . . the toughness to "take it" steadily day after day that makes these belts the best buy for handling all kinds of material.

Look over these tonnage records that have been turned in by "Cincinnati" users . . . then let Cincinnati Conveyor Belts add to efficiency and profits in your plant.

| | Tonnage Conveyed |
|---|---|
| Sand and Gravel | 6,500,000 |
| Sand and Gravel | 7,500,000 |
| Crushed Rock | 2,200,000 |
| Limestone | 1,750,000 |

**THE CINCINNATI RUBBER MFG. CO.**
Cincinnati, Ohio

**CINCINNATI CONVEYOR BELTS**

**TAYLOR SPIRAL PIPE IS *Sensible* PIPE**

IT'S a trim, modern pipe. It has all the load-carrying ability of pipe many times its weight, but without being handicapped by excess bulk. It can be handled more easily, transported less expensively—installed at a cost approximately half that of most pipe of equal rating.

The secret of spiral pipe lies in the spiral reinforcing seam which stiffens and strengthens it from end to end. In Taylor Spiral Pipe this seam has been strengthened and perfected, through 30 years of development, to provide maximum resistance to bursting, collapsing and other stresses.

There is a size and gauge of Taylor Spiral Pipe, with any type of end joint or protective covering, to meet every need. Write for Catalog 404.

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**TAYLOR *Spiral* PIPE**

**NO CRIMPING "FINGER PINCH" THAT SPOILS WIRE ROPE**

When a Laughlin drop forged Safety Clip takes hold of wire rope, it means business. The solid fist-like grip is 50% more efficient than ordinary U-Bolt Clips, as proved by recent tests at a famous engineering school.

You also save the rope that would ordinarily be cut off after being crimped by the "finger pinch" action of U-Bolt Clips. Laughlin Safety Clips, when removed, leave the rope straight, uncrimped, ready to use again.

**FEWER CLIPS NEEDED.** Where you've been using four ordinary U-Bolt Clips, you will need only three Laughlin Safety Clips to get the same strength.

**FASTER TO APPLY.** Laughlin Safety Clips have nuts on opposite sides — easy to get at — you can use two wrenches at once. That saves time — and many a cuss-word.

Write for the free booklet giving results of tests made by a famous engineering school. Take the first step to saving some real money by mailing the coupon now.

**THE THOMAS LAUGHLIN CO.**
**Portland, Maine**

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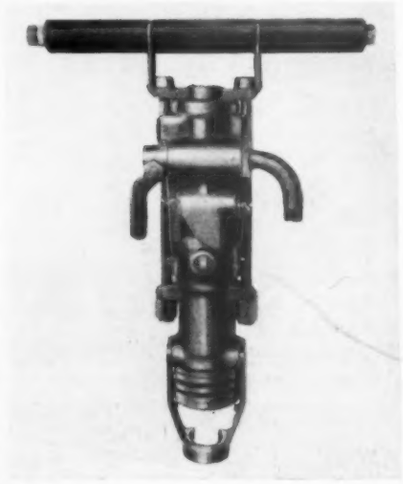
Check here for catalog on items below ☐

Look for Laughlin products in Thomas' Register and buy through your distributor.

new vertical shaft pumps is shown. Motor, coupling, thrust bearing anl housing are supported by a reinforced plate which serves as a structural member and the strut serves as a conduit for lubricating the lower bearings. Other features include: inverted intake in place of side or bottom openings to avert gas binding and to utilize the hydraulic thrust to counterbalance the weight of the revolving parts; liberal and simple slippage seal adjustment and split yoke bearing supports which are replaceable without dismantling. Either open or shrouded impellers are available, of either multi-vane or two-vane trash type.

## • Drill

A new, light sinking drill, known as the S-33, has just been announced by the Gardner-Denver Company, Quincy, Illinois. It is designed to combine exceptionally light weight with the speed and power ordinarily associated with much heavier drills. The manufacturer says that this 31-pound sinker is specially designed for close quarter work where excessive weight is a handicap. The S-33 may be easily held in any position for chute blasting, plugging and hitch-cutting.



Lightweight sinker drill.

Its power and speed are largely due to the four-pawl rotation, instead of the two-pawl generally used in this weight class. The pawls are reversible for double wear and a special spring eliminates the necessity of pawl plungers. These springs are conical, wound from flat spring stock and, unlike the wire coil springs, cannot wear themselves out within the rifle bar.

The exhaust control valve when closed diverts live air at full line pressure to clean the bottom of the hole.

## • Welding Rod

The American Manganese Steel Division of the American Brake Shoe & Foundry Company, Chicago Heights, Il'inois, has introduced Amsco Mo-Mang welding rod, described as a low-cost manganese-molybdenum steel welding rod for building up worn high managnese, carbon steel and grey-iron castings. It is available in 18-inch lengths in the bare form for straight d.c. welding and in the combination coated form for both d.c. and a.c. applications.

## • Pump

The Pomona Pump Company, Pomona, California, announces the complete redesign of its line of 6-inch medium capacity vertical turbine pumps. For a desired capacity of 100 gallons per minute against 110 feet lift in a well and 50 pounds pressure above, a 7½ horsepower motor is required, as against a 10 horsepower motor with the old model.

Vertical turbine pump.

Other advantages of these pumps, making for extremely low operating costs, lie in the facts that they are water-lubricated, with no stuffing box below ground level; that the specially-designed semi-open impeller can be adjusted from the surface for wear and for changing capacity; and that they are non-sandlocking and non-gaslocking.

Constructed of high quality bronze, the Pomona semi-open impellers operate in a cone-shaped seat in the pump bowls. Correct curvature of the impeller vanes assures maximum lifting capacity and prevents overloading of motor regardless of changes in water level.

## • Truck-Body Hoist

A new single-cylinder telescopic hydraulic hoist that is said to handle unusually heavy loads with ease has been introduced by The Heil Company, Milwaukee. It has a low mounting which varies between 8 and 15 inches depending on tire clearances as well as hoist clearance of the truck mechanism. All unnecessary interference with the truck running gear is eliminated by the exceptionally compact design of the hoist mechanism.

To prevent the body from dropping suddenly in the event the pressure fails, the hoist is fitted with a check valve on the high pressure side.

The separate Heil precision-built pump can be located anywhere forward of the hoist. The pump is equipped with roller bearings and replaceable wear plates. The holding valve assembly is designed to raise, lower or hold the body at any desired angle.

### TRADE NOTES

Announcement has just been made by Quaker Rubber Corporation, Philadelphia, of additional personnel in their sales force as follows:

Elmer Asbridge, formerly assistant manager, Chicago branch, will cover western Missouri and eastern Kansas; Gene H. Neupert will look after St. Louis and vicinity; C. B. Close is assigned the territory of central and eastern Tennessee, making his headquarters in Nashville.

Elastic Stop Nut Corporation announces the moving of its general offices from Elizabeth, New Jersey, to its new plant at 2332 Vauxhall Road, Union, New Jersey, a suburb of Newark. The transfer of manufacturing equipment, which has been in progress for several weeks, has been completed.

The CONCRETE MANUFACTURER

A Special Section of...

# *Send Your Request in NOW for the 1941 Edition of* CONCRETE INDUSTRIES YEARBOOK

Since its first appearance two years ago the *Concrete Industries Yearbook* has been in greater demand than the available supply. The 1941 edition, ready in January, will be revised to include the latest trends in the production and marketing of concrete products and ready-mixed concrete. New equipment will be illustrated and described. Catalog pages will present the new and improved equipment you will need in what is predicted will be the busiest year the concrete industries have experienced in more than a decade.

The 1941 edition will be distributed free of charge to recognized producers of concrete products and ready-mixed concrete who request it on their letterhead. Be sure to state just what you produce (concrete block, brick, pipe, ready-mixed concrete, etc.) when making your request.

**PIT AND QUARRY PUBLICATIONS**

**538 South Clark St.** **Chicago, Ill.**

# The CONCRETE MANUFACTURER

October, 1940

A SPECIAL SECTION OF PIT AND QUARRY DEVOTED TO PRODUCTION MARKETING AND USES OF CONCRETE PRODUCTS AND READY-MIXED CONCRETE

Published by Pit and Quarry Publications
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## Opens Another Plant

The Universal Concrete Pipe Company of Columbus, Ohio, manufacturer of concrete pipe and concrete-pipe machinery, is opening another branch plant at Worcester, Massachusetts.

The building is of concrete-block construction and is located on a 15-acre tract recently purchased. The investment in the plant will be approximately $50,000.

## Gets Army Contract

The ready-mixed-concrete plant of the Certified Strength Concrete Company, which has been located on the property of the Breen Gravel Company at Grand Rapids, Michigan, has been moved intact to Camp Custer near Battle Creek, Michigan to supply about 18,000 cubic yards of concrete for new barracks and other structures at the army camp.

We Announce the
OPENING
of a Fine New
"Ready Mixed"
CONCRETE PLANT
In Idaho Falls!
Mixing concrete is a highly specialized job that requires accuracy in measurement of materials and thoroughness in the mixing. "READY MIXED" is the scientific, accurate and dependable way to mix concrete.
OFFICE PHONE 932

At our modern plant, located near the South side of the city, on the Yellowstone highway, we load our modern transit mixers with dependable washed crushed gravel, clean sand and cement, all accurately weighed and measured to give you a uniform mix of highest quality "CERTIFIED STRENGTH" concrete. No dirt, no silt, no sediment or any other foreign matter to weaken your concrete.

The mixing is done in the truck mixer while enroute to your job. When the truck arrives, you have a batch of thoroughly mixed fine quality concrete, already to pour into your forms.

No muss, no fuss, no clean up afterwards. No worry about getting good materials, or the correct proportions; and no headaches when you pay the bill, for the price is right and there is no waste. Every load of Burggraf's "READY MIXED" is accompanied by a certified guarantee that the concrete inside the mixing drum can't be beaten. We will meet any specifications for all types of jobs.

**NICK BURGGRAF, INC.**

"The Home of Burggraf's Ready Mixed Concrete"


This is the way Nick Burggraf, Inc., announced the opening of its new ready-mixed-concrete plant at Idaho Falls, Idaho, recently, using space three columns wide, eight inches deep in the daily newspaper. The copy is effective from an advertising standpoint because it tells the "reasons why" the general public of Idaho Falls should use the product and does not waste space with pictures of the plant, the trucks, or company personnel.

# Erects Model Cinder-Block Plant to Replace One Damaged by Hurricane

New plant of the Cinder Products Corporation at Providence. Aggregates ramp and elevator at left, curing rooms at right.

AFTER many years of being buffeted around by business and weather conditions, Royal Sterling, president and general manager of the Cinder Products Corporation, Providence, Rhode Island, now seems to have a plant which is flood- and depression-proof. Mr. Sterling entered the cinder-block field in 1930 with the Cinder Concrete Units Corporation, operating a plant at Somerville, near Boston, Massachusetts. This was a large plant with three big tamper block machines and when the depression came along the overhead proved its undoing.

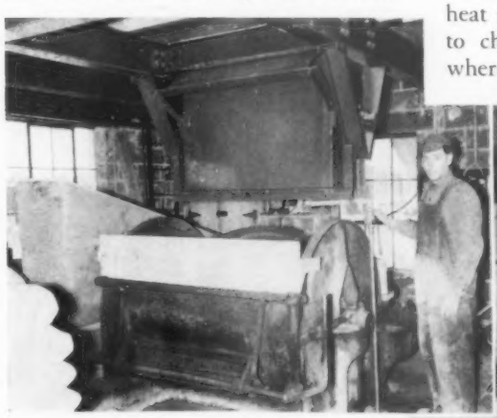
**By W. E. TRAUFFER**

In 1935 Mr. Sterling went to Providence and formed the Cinder Products Corporation. A new Kent-Root Vibra-Press and other new equipment was installed in an old building near the water front. Things went along merrily until September 21, 1938 when the memorable hurricane hit, doing damage amounting to several thousands of dollars to the plant and disarranging the storage yard. The plant was operating again in 17 days, but Mr. Sterling at once began looking for a flood-proof location. A 1-acre piece of property in a growing industrial section was purchased and on it was built one of the most complete, efficient and attractive small plants the writer has yet seen. It is compact, occupying a space of only 50 by 80 feet, and is built entirely of the company's product. It has a capacity of over 2,000 standard blocks in 8 hours and went into operation in May, 1940.

The old plant was expensive to operate. The steam rooms lost too much heat and six operations were necessary to change the block-machine hopper, whereas only two are required in the new plant. Shipments are still being made from the storage yard of the old plant while storage facilities for over 100,000 blocks are being built at the new plant.

The cinders used are obtained from a near gas-company plant and contain only a small amount of combustibles. A trace of sulphur present is neutralized by the alkaline cement. The cinders are dumped from trucks into a hopper from which a reciprocating feeder passes them over a Dings rotary magnet which removes all cinders having even a trace of iron. A bucket-elevator feeds the cinders to a short belt-conveyor which carries them to a vibrating screen. The ½-inch plus oversize from this screen goes to a Sturtevant Number 00 rotary crusher and back into the hopper in closed circuit. The minus ½-inch cinders drop from the screen into a 40-cubic yard bin. Cement is raised to the mixer floor 10 sacks at a time by an Electrolift hoist.

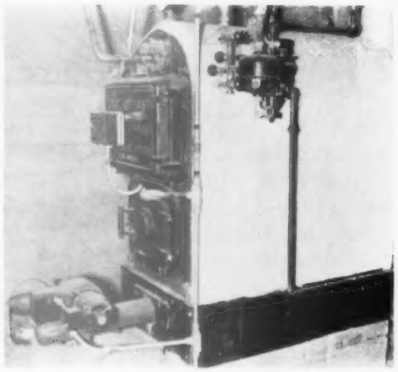
President Royal Sterling and some of the fine units he produces.



ABOVE—The batcher over the mixer. RIGHT—Tilted, it discharges the batch into mixer.

An "automatic" batcher of original design feeds the cinders into the 21-cubic foot Besser mixer, where cement is added from sacks. The batcher consists of a vertical sleeve of rectangular cross-section shape which is pivoted on a horizontal shaft at its center. At the upper and lower ends of the sleeve are arc gates, the top one attached to the batcher, and the bottom one stationary. When the sleeve is in a vertical position the top gate is open and the bottom closed, allowing cinders to flow into the batcher. To discharge the batch the

operator tilts the batcher a few degrees, thus closing the bin opening and opening the bottom gate. The batcher has only half the mixer's capacity, but two batches are measured into the mixer as fast as the operator can pull the lever. Hot mixing water is used the year around because it makes the blocks work better in the machine and reduces the curing time.



The horizontal return tubular boiler which supplies steam for curing.

The vibration-pressure block machine. Motor and drive at upper right, pallet oiler at left.

Concrete is discharged from the mixer into the hopper of the Kent-Root Vibra-Press, which holds more than a batch. This makes it possible to mix each batch from 5 to 6 minutes, resulting in a better concrete. The Vibra-Press, as its name indicates, first vibrates, then presses to size all parts of the block under terrific pressure. A Root automatic pallet oiler is used.

The blocks are loaded on steel racks which are hauled into the curing rooms on two Yale & Towne lift trucks. There are four rooms, each 9 feet by 40 feet in area and 6 feet high and holding 780 blocks. Steam for curing is supplied by a Fitzgibbons horizontal return tubular steel boiler rated at 1,560 cubic feet. This boiler operates quickly and efficiently and has an automatic oil-burner set to keep the room temperature at 200 degrees F. with 15 pounds' pressure. Hot water for mixing is also provided by this boiler. The curing rooms have 4½-inch solid reinforced-concrete roofs with 1 inch of Celotex insulation. They are insulated at their ends by 12-inch dead-air spaces and have tight-sealing wooden doors.

Rack-load of blocks being removed from curing room to outdoor storage.

The curing system works so efficiently that blocks can be removed to outdoor storage within 4½ hours after they are made. The same lift trucks are being used for this purpose. Later a covered storage shed will be built and blocks will be transported to storage on a gravity roller-conveyor.

The cinders used in this plant are of unusually high quality and even after steam curing the blocks show no "popping" or discoloration. They are well finished and have such an attractive texture that they are widely used for exposed work coated with cement paint. Most of the output is standard 8- by 8- by 16-inch blocks but other standard sizes, such as 4- and 6- by 16-inch, are also made.

These blocks are made with a 1:7 semi-dry mix and far exceed the building-code requirement of 800 pounds per square inch of gross area. Their absorption is less than 8 pounds of water per cubic foot of material, according to Mr. Sterling. The standard blocks

*(Continued on page 73)*

Wheeling concrete from truck-mixer to skip on one of the 52 apartment buildings in the Metropolitan project.

# SUPPLIES CINDER CONCRETE FOR FLOORS AND ROOFS OF HUGE APARTMENT PROJECT

THE Park Chester Development of the Metropolitan Life Insurance Company in the Bronx, New York, is the largest of the many private and government housing projects now under way. It has received wide publicity in newspapers, magazines and in exhibits, such as the one at the New York World's Fair, where a scale model is shown. This project consists of 52 buildings ranging from 8 to 14 stories in height. There are 12,273 apartments of 3, 4 and 5 rooms and a few of 2 rooms. The monthly rentals range from $14 to $16 per room and the apartments are intended for people in the $1,800 to $4,000 yearly-income range. When completely occupied by about March 1, 1941, the population of this city within a city will be about 42,000. Included in the project are 5 garages with concrete ramps and passenger elevators, a theater, and 500,000 square feet of store space. All the buildings are of reinforced concrete and brick construction.

The construction of this huge project is interesting in many ways. The use of ready-mixed cinder concrete for all the floors and roofs is unusual. The 12,000,000 cubic feet of floor space required 10,000 cubic yards of gravel concrete for the basement floors and 250,000 cubic yards of cinder concrete for the roofs and all the other floors.

The contract for mixing and placing all this concrete was awarded to the Washington Concrete Corporation of New York. This company was formed in 1917 to do concrete construction work and has had many big jobs. These included finishing the floors in the Empire State Building and supplying all the concrete on the Williams-

Another batching-plant view. Cement elevator in foreground.

burg, Harlem, Hillside and Knickerbocker Village housing projects in the New York area.

For the Park Chester job the company built its first ready-mixed-concrete plant, which is also thought to be one of the first such plants built to produce cinder concrete. The actual pouring of the concrete was begun on March 1, 1939, in spite of the unusually cold weather, which made it difficult to deliver concrete at the required temperature. Increasing the difficulties was the fact that a range of slumps from 0 to 100 per cent. was required.

In spite of all these obstacles the company recently finished its contract well within schedule. The "peak" day's pour was 1,257 cubic yards in 8 hours. The highest hourly output was 180 cubic yards, and 5,890 cubic yards were poured in the best 40-hour week. These are records for both efficiency and consistency of which any producer might be proud. The same fleet of

Covered conveyor running from aggregate hopper to batching plant.

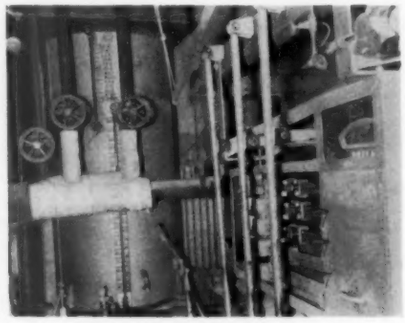
In this view only a small part of this huge housing development is shown.

9 truck-mixers was used throughout the job.

Cinders and other aggregates were received in trucks, from which they were discharged into a 30-cubic yard Butler steel hopper. A 24-inch by 150-foot inclined belt-conveyor carried these materials to a 150-cubic yard, 4-compartment Butler steel bin. A canvas cover over the conveyors kept the cinders from being blown away. Two compartments were used to store cinders or gravel, one for sand and one for cement.

The cement was received in bulk in cars at a railroad siding ¼ mile away and was unloaded into a Butler hopper. From this it was transferred to dump trucks covered with canvas for haulage to the job. It was discharged into a 10-cubic yard steel hopper from which a bucket-elevator transferred it to the 250-barrel cement compartment.

The batching was done in a 5-cubic yard, 2-compartment Butler batcher. The bin and batcher gates were manually operated. Water was supplied from a 350-gallon tank with a gage glass and two 3-inch feed lines. During cold weather steam was supplied at high pressure through a 4-inch line to four mixing nozzles in the water tank. Air jets were used in the cement compartments to keep a steady flow.



Compact arrangement of water tank, bin-gate levers, scale, etc., for fast batching.

The fleet consisted of nine 5-cubic yard truck-mixers all mounted on Mack chassis. Seven were powered by Cummins Diesel engines and two by gasoline engines. Six Chain Belt Rex and three Jaeger mixers were used.

In one building a concrete with an admixture of Aerocrete was used. This produced a concrete as light as that made with cinders but slightly more expensive. A 1:2:5 mix was used for cinder concrete and a 1:2:3½ mix for sand and stone concrete. All the aggregates were supplied by the Colonial Sand & Stone Company. Whitehall cement was used.

The company's contract included the pouring and finishing of all the floors and roofs. In connection with this work 18 hoisting towers totalling 2 miles in height were erected. Over 4,500,000 board feet of lumber was used. Other materials used included 250,000 cubic yards of cinders, 100,000 cubic yards of sand, 10,000 cubic yards of gravel, 300,000 barrels of cement and 14,000,000 square feet of reinforcing steel and wire.

Norman Eastwood was job superintendent on this and the other projects mentioned in this article. The officers of the Washington Concrete Corporation are: E. Scudellari, president; P. Pedersen, vice-president and treasurer; S. Vighi, secretary.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INTO HOPPERS, BUCKETS

OVER DIRT PILES INTO THE FORMS

FASTEST LOADING, FASTEST MIXING AND FASTEST HIGH DISCHARGING TRUCK MIXER ON THE MARKET . . .

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Latest development by world's largest mixer manufacturer — mobile 2, 3 and 4 yd. concrete plants that cut placing costs, deliver proven higher strength concrete. One-Shot Top Loading, 2-Speed Mixing, Vacuum Controlled Discharge, many other features. GET CATALOG, PRICES, EASY TERMS.

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2, 3, 4 Cu. Yd. Sizes. 2 Yd. Size Mounts on Short Wheelbase Ford-Type Trucks

Also STANDARD HEAVY DUTY MIXERS up to 5½ Cu. Yds. (7½ Cu. Yd. Agitators)

THE JAEGER MACHINE CO., 602 Dublin Ave., Columbus, Ohio

By W. E. TRAUFFER

# Florida Products Maker Enjoys Best Sales Year Since Collapse of Boom

A $3,000 house with two bedrooms in which Kissam blocks were used.

Another Kissam concrete-block house, this one in the $6,000 price range.

THE Kissam Builders' Supply Company of Orlando, Florida, has won an enviable reputation as a producer of concrete building units, having been in this business since 1920. In the two decades of its existence the company has managed to survive two major depressions and the collapse of the Florida boom and is now having the best year in its history. Seven vibrating machines and three hand machines of the company's own design are kept busy supplying the demand.

Allen Kissam and his brother, E. W. Kissam, started in 1920 with a mixer and two hand-operated machines. The demand for their products increased so rapidly that lack of space soon necessitated moving to the present location. Another tile machine was added then. Lack of space is again a handicap and operations will soon be moved to another location.

In 1924 Allen Kissam built a hand-operated stripper machine to make an 8-inch high block with a 1-inch wall. This product soon outsold the tiles and more machines were built. During the height of the Florida boom in 1925-26 eight machines were in operation, producing over 7,000 blocks daily. In 1927 the company was incorporated to sell a complete line of building supplies. By 1929 building had almost stopped in this area and the pick-up did not begin until 1934.

During this slack period Mr. Kissam designed a vibrator block machine on which he took out his first patent in 1937. This machine has a vibrating core surrounded by vertical stripping means in a stationary mold-box. Since that time many improvements have been made in the design and new ma-

An attractive $7,500 residence with three bedrooms.

Moving a rack of blocks into the storage yard.

chines have been built to replace older ones. There are now seven vibrating machines and three hand machines in operation. The latter will also be gradually replaced with vibrating machines. The latest model machine when making 4- by 8- by 12-inch blocks, easily averages 1,500 units per 8-hour day with one man operating it, mixing his own concrete, and putting the finished blocks into racks. Under more favorable conditions in the new location even better results are expected.

Making 4- by 8- by 12-inch blocks on one of the company's newest vibrating machines.

Vibrating machine making two 4- by 4- by 12-inch blocks.

Jamb blocks being made in a hand-operated machine.

Hand-operated machine turning out lintel units.

The plant is located in a small industrial district of Orlando close to the business section and a rapidly growing residential section. Aggregates are received in gondola cars on a railroad siding and are unloaded into eight ground-storage bins. Four bins are used for Florida hard rock from Brooksville and four contain sand from Leesburg and Interlachen. Eight machines, seven vibrating and one hand-operated, are lined up in a row parallel to these bins and, each of four Jaeger 4- and 7-cubic foot tilting concrete mixers serves two machines. Each machine operator loads the ingredients for a batch into his mixer and shovels the concrete from the floor into the hopper of his machine. This practice may seem inefficient but it has been found that this occasional diversion from the monotony of operating the machine refreshes the operator and takes little if any from his day's output. When the plant is moved to a new location, however, provisions will be made for mechanical handling of the aggregates and for centralized batching and mixing of the concrete.

Each operator uses a short-handled hoe to scrape the concrete from the hopper into the mold-box. A special tamper on the end of the hoe handle is used to press the concrete into the mold when making tiles or thin-walled blocks of sticky lime-rock concrete. This is not necessary when a sand and pea gravel or other free-flowing mix is used. Vibration of $\frac{3}{64}$-inch amplitude for 10 seconds compacts the block after which the hopper is pushed back, automatically cutting off the vibration and troweling off the top of the block. A hand lever with a short throw is used to eject the block by lifting the cast-iron pallet to the top of the mold-box whence the operator removes it to a pedestal. He then refills his machine and starts the vibration while he carries the block to a rack. The loaded racks are hauled away for curing and storage by other men using Barrett-Cravens lift trucks. Usually about 60,000 units are kept in storage.

Two hand-operated machines in the yard are used to assist. Drain tiles and roofing tiles are made on special machines purchased by the company.

Almost every known size of block is being made in this plant, but 4- by 8- by 12-inch and 8- by 8- by 16-inch are the standard sizes. The former is actually $3\frac{5}{8}$ inches high and $11\frac{5}{8}$ inches long. Nearly 60 types and sizes are made. Among these are 4- by 8- by 16-inch, 4- by 4- by 16-inch, 4- by 4- by 12-inch and 4- by 4- by 8-inch tiles and lintel blocks, jamb blocks 6, 8, 10, 12, 14, and 16 inches long, and 4- and 8- by 12- by 16-inch blocks. Efforts are now being made to eliminate some of the products which nearly duplicate each other. Any one of the machines can be readily converted for the manufacture of any of these units. Because of the many machines used in this plant, however, it has been found more economical to keep the same machines making the more popular sizes and changing only a few of them for the products less in demand.

A 1:2½:4 mix is ordinarily used and the water content is varied with the product, usually being just wet enough to be workable. The 8- by 8- by 16-inch blocks are being made with a wall thickness of 1¼ inches and the tiles have 1-inch walls. The former fail at between 120,000 and 150,000 pounds pressure or about 1,500 pounds per square inch of gross area. The 4- by 8-

by 12-inch blocks fail to break at the 200,000-pound capacity of the testing machine. Absorption is well under the federal government limit of 7 per cent., which explains why these blocks are widely used exposed both inside and outside.

Prices are higher here than in the Miami area but are low considering the cost of the aggregates. Sand costs 70 cents and rock $1.16 per ton at the point of shipment and freight rates add about $1.10 to these prices. In spite of this the 4- by 8- by 12-inch blocks sell for 5½ cents and the 8- by 8- by 16-inch blocks for 12½ cents each.

When this company first went into business in 1920 only about one concrete-block building was being erected for every hundred frame dwellings in this area. A few were built of clay tile and brick. Now clay products are seldom used and concrete building units are used in about 60 per cent. of the buildings. One reason for this excellent showing is the fact that a finished building made of 4- by 8- by 12-inch exposed concrete blocks now costs about the same as a wood frame structure. Lower insurance rates and lower maintenance costs are major inducements.

Mr. Kissam is a firm believer in the future of the 4- by 8- by 12-inch block, because of the better architectural effects obtainable and the ease of handling. Partly because of his efforts this size is rapidly replacing the 8-inch standard block and is even being used in commercial buildings. Now about 6,000 of the smaller blocks are sold daily as compared with about 1,000 of the larger units. The company recently sold over 800,000 of the 4- by 8- and 4- by 4- by 12-inch blocks for a Negro slum clearance project. Shipments are made to all parts of the state but 95 per cent. of sales are made within a 75-mile radius.

## Cinder Products *(from page 68)*

weigh 30 pounds each, compared to 48 pounds for local sand-and-gravel blocks.

Much of the output is used for backup work, but there is a growing market for these blocks for exposed work. Large construction projects have provided the main outlets, but the use of these blocks in private houses is growing. Recently 40,000 blocks were furnished for a $2,000,000 ocean-beach development in New London, Connecticut. Sales are made in a large area including the cities of Worcester and New London.

Mr. Sterling not only supervises production but is also in charge of sales. In addition to keeping in contact with architects and contractors he also follows up building permits and advises on engineering design, etc. Other officers of the company are John C. Dinsmoor, vice-president, and James H. Goddard, secretary.

## Concrete Industries Show, February 10-12

Inviting the construction industry to "Come See How It's Done in '41," it is announced that the 1941 Concrete Industries Exposition will be held in Chicago at the Sherman Hotel on February 10, 11 and 12.

The Exposition is again to be held concurrently with the annual conventions of the National Concrete Masonry Association, the American Concrete Contractors Association, the Cast Stone Institute and the American Concrete Pipe Association. Since the Road Show and the Concrete Industries Exposition are now held in alternate years, the latter will be one of the largest equipment shows for 1941.

Coincident with the setting of the Exposition dates, E. J. Goes of the Koehring Company was named as chairman of the Manufacturers' Publicity Committee, which has been formed to promote attendance.


Again REX MAKES TRUCK MIXER HISTORY!

NO OTHER TRUCK MIXER HAS THESE!

1 Quick-as-a-flash charging.

2 Ability to handle lower slump mixes.

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4 Rex anti-freeze water system with positive injection of water into the heart of the batch for faster mixing.

5 The finest drive ever put on a truck mixer—the improved Rex Chabelco chain drive and Rex twin clutch transmission.

Be Right—Buy Rex!

NOW!...A LINE OF PROVED *Hi-Discharge* MOTO-MIXERS

**For over eleven years** Rex has led the truck mixer field in the development of faster, more efficient truck mixers! Here's the latest, the Rex Hi-Discharge Moto-Mixer, now thoroughly proved on jobs of all sizes and types.

Rex—not you—has done the experimental work!

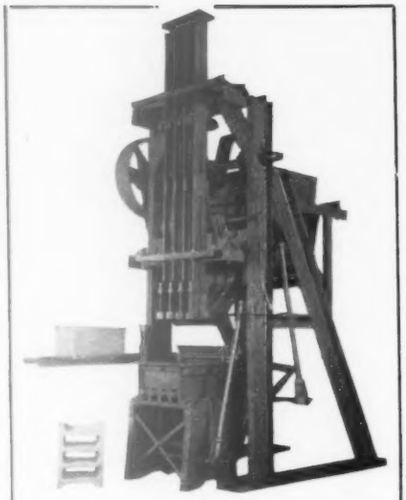
Not just another truck mixer—the new Rex Hi-Discharge has features never before offered on any truck mixer! Study the list at the left—a list of features you've been waiting for—found solely on these great new Rex's. Built to the newly adopted standards, the Rex Hi-Discharge gives greater payload capacity and the greatest spouting range found on any truck mixer of equal size. *All this—plus the many Rex-pioneered advantages found on all Rex Moto-Mixers.*

Check the list of Rex features—you will see why it pays to depend on Rex for up-to-date, lower cost ways to mix, haul and place concrete! Send for free folder, "A New Era in Truck Mixer History." Address Chain Belt Company, Dept. MM-10, 1646 W. Bruce St., Milwaukee, Wisconsin.

CHAIN BELT COMPANY OF MILWAUKEE

REX Hi-Discharge MOTO-MIXERS

Copyright Chain Belt Co. 1940



**An All-Purpose Machine**

The Junior Stripper will turn out more blocks per man than any other hand-operated machine on the market . . . 200 per hour being easily maintained! Nor has quality of output been sacrificed for the sake of speed. Units are uniformly dense, true to shape, of uniform texture.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers, and Cast Iron and Press Steel pallets Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

**ANCHOR CONCRETE MACHINERY CO.**
G. M. Friel, Manager — Columbus, Ohio

**COMMERCIAL**

**CORED Steel PALLETS**

Cored pallets mean better curing and quicker curing, which cuts costs, and, because more blocks can be put on the rack or car, kiln capacity is increased.

They are cheaper to clean and oil. With cast iron cored pallets, rust is not a factor.

There is no alleged monopoly in the manufacture of cored pallet machines. Competition on this type of machine provides price protection for buyers.

**THE COMMERCIAL SHEARING AND STAMPING CO.**
YOUNGSTOWN, OHIO

## Nelson Plans New Branch at Omaha

The Nelson Concrete Culvert Company has announced it will erect a $30,000 plant in Omaha, for the production of concrete products. Ground on which the factory is being built has been leased from the Union Pacific Railroad.

The plant is to be completed before winter, according to L. E Fawcett, manager. Main offices of the Nelson company are in East St. Louis.

## Soo Gravel Company in Products Business

The Soo Sand & Gravel Company, Sault Ste. Marie, Michigan, has installed a Besser semi-automatic block machine in its new concrete-products plant.

Steam-curing rooms and cinder crushing-and-screening equipment will be added later, according to James Lapish, plant manager.

## Lima Ready-Mixed Firm Making Blocks

The Lima Mixed Concrete Company of Lima, Ohio, has gone into the concrete-block business and has just installed a Besser stripper which will turn out about 2,000 units per day.

Cliff M. Wood is general manager of the concern.

## Don Wheelock Erects New Plant Structure

The Vibrated Concrete Company of Clay Center, Kansas is moving into a new concrete-block building with 3,600 square feet of floor space.

The company, which manufactures concrete blocks, bricks, pipes and tiles, is owned and managed by Don Wheelock, Jr.

## Vault Maker Will Move to New Plant

Shirar Brothers of Plymouth, Indiana are erecting a new building to house their concrete burial vault business.

The new structure, 40 by 90 feet in size, will be ready for occupancy by early winter.

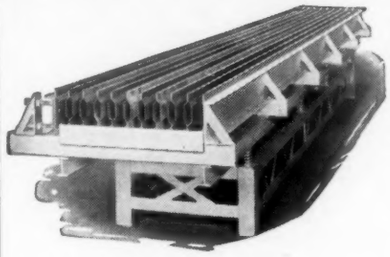
**WANTED**

Continuous Mixer capable of producing five to ten cubic yards per hour. Kent Machine preferred.

**E. J. BOGNAR**
**507 Oliver Building — Pittsburgh, Pa.**

**KIRK & BLUM**

**STEEL FORMS for CONCRETE JOISTS**



**Made in Standard 20-Ft. Lengths —also in special lengths to meet individual requirements.**

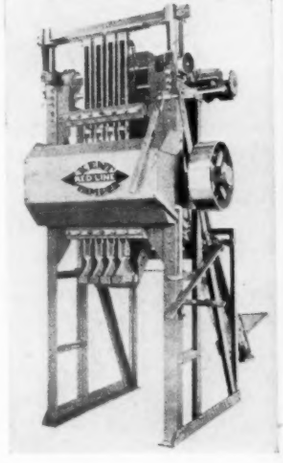
**HEAVY DUTY VIBRATING TABLES can be furnished for this equipment.**

We manufacture Sewer Forms—Curb and Gutter Forms—Steel Concrete Forms of All Kinds. Details on request. Write—no obligation.

**THE KIRK & BLUM MFG. CO.**
**2818 Spring Grove Avenue**
**Cincinnati, Ohio**

**SHOCK ABSORBING**

**KENT TAMPER**



KENT Shock-Absorbing Tampers can take all the use and abuse that you can give it.

All-steel construction with oversize parts. Built for reliable low-cost concrete block production.

**Ask for Bulletin**

**THE KENT MACHINE CO.**
**Cuyahoga Falls, Ohio**

# HERE'S A NEW *LOW-COST* CONCRETE FLOOR

Here is a practical answer to the question "How can we get a good low-cost, finished concrete floor?

Precast concrete joists open the door to the low-cost floor market. STONEX clinches the sale by solving the problem of a floor finish.

The illustration above shows how simple the tile are to place . . . the speed with which a floor can be completed . . . the distinctive result that is obtained, at an amazingly low cost.

The new and exclusive STONEX process enables products manufacturers to produce—at low cost—tile of all shapes, sizes, and for all purposes . . . tile that are harder than granite, as proved by laboratory tests . . . in beautiful colors; all shades, tones and blends, that are an integral part of the tile itself.

The system has been perfected and proved by test and job experience. It is all ready for alert products manufacturers to merchandise. It is just what you need to win your local floor business.

*Write today for more details about STONEX process and our plan to license manufacturers to make and sell this system*

**STONEX INDUSTRIES, 210 Seventy-First Street, Miami Beach, Florida**

SAUERMAN
*Long Range*
MACHINES

HANDLE pit or bank excavation, stripping, stock piling, or reclaiming at lowest possible cost and a *higher profit to you with* a SAUERMAN Power Drag Scraper or Cableway Excavator.

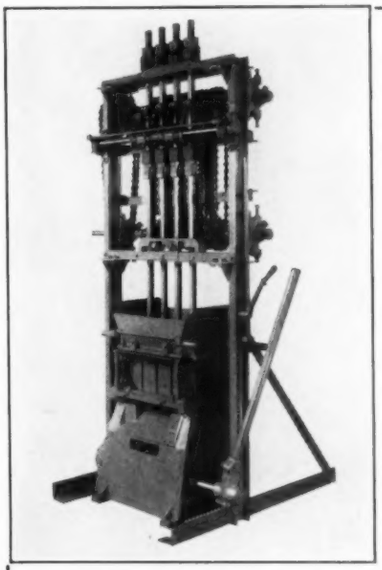
The wide versatility and ability of these machines to work economically has proven them unequalled for long range work.

Below is shown a SAUERMAN Slackline Cableway moving gravel from a pit 110 ft. deep to the top of screening plant at a rate of 90 cu. yd. per hour and at a cost of less than 5c per yard. This is just one of the many plants, both large and small, where SAUERMAN Machines are making exceptional profits for their operators by digging, hauling and dumping in a straight line operation controlled by one man.

**SAUERMAN BROS. Inc.** 434 S. Clinton St. Chicago, U. S. A.

**Scrapers and Cableways Since 1909**

***Write for Catalog and Advice on Your Problems!***



Miles CONCRETE EQUIPMENT

**HIGH** Production
**LOW** Investment

**INVESTIGATE** before you buy any make of equipment

WRITE FOR CATALOG

Complete information on our entire line of pioneer MILES EQUIPMENT will be sent without obligation.

**THE MILES MANUFACTURING CO.**
Department 21
JACKSON, MICHIGAN

# "AND EVERY ONE ALIKE"

WHEN MADE ON THE

## JACKSON BRICK MACHINE

Producers using the JACKSON concrete brick machines are outselling their competitors. Their profits are greater because their operating and maintenance costs are lower.

The JACKSON brick machines have been in use for over 25 years, they are hard to wear out and will pay for themselves over and over again.

Completely automatic, no slowing down. Day in and day out these machines turn out an endless stream of concrete brick. Production set by the machine, not by the labor.

No other concrete brick machine on the market today makes brick without the use of pallets. This feature alone will more than pay for the machine in a very short time.

Let us show you why the JACKSON concrete brick making equipment is the most efficient and economical to own.

**WRITE FOR ILLUSTRATED FOLDER**

**JACKSON & CHURCH CO.**
**SAGINAW, MICH.**

MORE PROFITS

LOWER COSTS

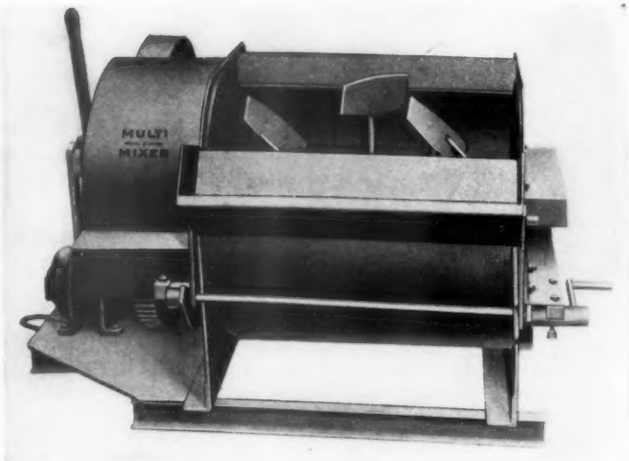
## THE KIRKHAM VIBRATOR

**Makes Strong, Dense, Weatherproof Blocks**

Economical Electrical Operation
Plain Wooden or Steel Pallets
Mold Boxes Changed in a Few Minutes

**CONCRETE TRANSPORT MIXER CO., INC.**
660 ROSEDALE AVE. ST. LOUIS, MO.

# MULTIPLEX
**MULTI-MIXER**




- All-steel, welded frame
- Enclosed drive gears running in oil
- Shafts mounted on roller bearings
- No costly clutches or belts to replace
- End discharge door gives access at all times
- New design mixing paddles for quicker mix
- Long wearing blades and liners
- Capacities 5 to 40 cu.ft. and larger

**THE MULTIPLEX CONCRETE MACHINERY COMPANY**
Elmore Ohio

# I USE DUNBRIK BECAUSE

FRED J. WALSH CO...
REAL ESTATE - BUILDERS
134 NORTH LA SALLE STREET
CHICAGO, ILLINOIS

Chicago Dunbrik Mfg. Company
5401 North Kedzie Avenue
Chicago, Illinois

Attention: Mr. Carlson

Gentlemen:

For our Lincolnwood project we are using Dunbrik in several attractive colors for facing with gray Dunbrik backing. These homes appeal to buyers because of their clean, accurate coursing and attractive colors.

**Our contractors like Dunbrik because they lay up rapidly and accurately, because of uniformity of size, perfect corners, edges, etc.**

We expect to be using an increasing number of your Dunbrik line for homes we are promoting.

As you know, I have been active in Chicago subdivision home building for many years; this Lincolnwood development is quite the best and is finding great public acceptance. We look forward to its continued growth as one of the outstanding new residential areas, setting new and higher standards.

Very truly yours,
FRED J. WALSH COMPANY

FJW/ha

**Mr. Fred Walsh — Believes in building for permanence — in his Lincolnwood Estates development he advertises and requires that all construction be either brick, or brick and stone.**

***"Our Contractors like Dunbrik because they lay up rapidly and accurately, because of uniformity of size, perfect corners, edges, etc."*** **is a comment heard many times daily wherever DUNBRIK is manufactured.**

**IT IS THE ONLY cement building unit with a nationally known trade name — the only one with a background of national advertising and national acceptance by the building industry.**

**THE DUNBRIK MACHINE is also the only machine equipped to make multiple sizes (called DUNSTONE) that make it possible to reduce permanent fire and vermin-proof construction to the cost level of frame.**

**WE EQUIP YOU with Automatic line production plant that enables you to turn out brick at a labor cost averaging less than $1.50 per thousand, and brick of absolute accuracy with trowelled water repellant faces.**

**WE FURNISH YOU with two distinct proven processes that enable you to manufacture these products in the most complete line of colors, shades and textures in the masonry material market.**

**THE FUTURE AND GROWTH of your business protected by territory franchise, and assistance through our Advertising Service and Engineering Departments.**

**WRITE OR WIRE TODAY for complete information on how you can become the Authorized DUNBRIK Manufacturer for your territory. No obligation.**

## W. E. DUNN MFG. CO.

420 W. 24TH ST. HOLLAND, MICHIGAN

# INFRINGEMENT NOTICE

To Builders and Users of Block Machines:

Please take notice that the Stearns Manufacturing Company of Adrian, Michigan, are the sole and exclusive licensees of "Joltcrete" vibration block machine patents and patent rights and have the sole and exclusive right to manufacture and sell such equipment.

At the present time there is a suit for patent infringement pending against H. W. Bell Company of New York City, a user of infringing equipment.

Others manufacturing infringing equipment and the users of such equipment will be prosecuted to the fullest extent of the law.

**LOUIS GELBMAN, *Inventor***

## LITTLE DAVE BRICKMAKER

**$6.00 to $10.00 PROFIT PER THOUSAND BRICK**

Every thousand brick pays you a return of 6 to 10% on your investment in the Brick Business.

At the low cost of this machine you can no longer afford to ignore the profitable possibilities of concrete brick.

The LITTLE DAVE BRICKMAKER is not an experiment, this machine has been proven in ten years of actual operation.

For producing FIRST CLASS concrete brick at a price anyone can afford, write today for complete information.

**R. F. REED COMPANY**

412 E. Michigan Ave. Three Rivers, Michigan

## "NAT-ALOY" LOCK CRIMP MESHES ASSURE ACCURACY FOR THE LIFE OF SCREEN

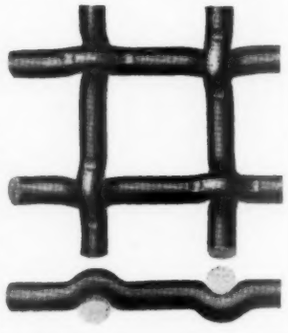
**"LONG WEARING"**

TOUGH SCREENS THAT RESIST ABRASION, WILL NOT CRYSTALIZE.

FURNISHED ALSO IN FLAT TOP AND DOUBLE CRIMP MESHES.

**IMMEDIATE SHIPMENTS FROM STOCK**

**WRITE FOR NEW CATALOG NO. 51**



**National Wire Cloth Co., Inc.**
**252-270 W. Fairfield Ave., St. Paul, Minn.**

## SEVEN MATERIALS IN ONE BIN?

"You Bet—this new BLAW-KNOX plant accurately measures and loads aggregates, cement, and water into truck mixers."

Blaw-Knox Truck Mixer Loading Plants include overhead storage bins for aggregates and cement; accurate Weighing Batchers for aggregates, cement and water; arranged for manual or automatic operation; complete conveyors for handling materials from cars or trucks to bins, when desired—all properly designed and built to your requirements as an efficient unit for truck mixer loading. See Blaw-Knox Catalog No. 1582.

15

**BLAW-KNOX** BLAW-KNOX DIVISION • OF BLAW-KNOX CO. • Farmers Bank Bldg. Pittsburgh, Pa

TRUCK MIXER LOADING PLANTS

## LOOKING FOR USED EQUIPMENT?

Refer to the listings in the Broadcast Section in this issue for a wide variety of used and surplus machinery and supplies.

# Strengthen EVERY Link *in Your Chain of Concrete Production!*

CHARGE

MIX IN TRANSIT

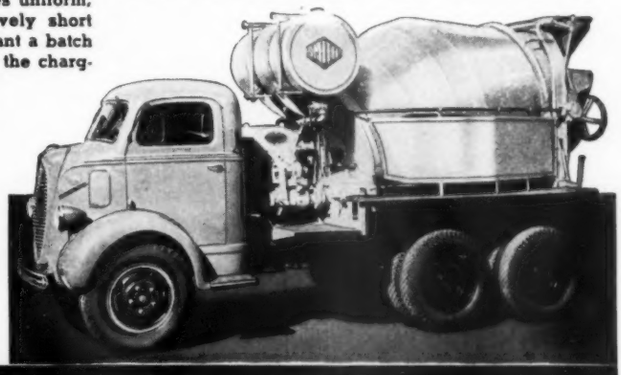
DISTRIBUTE

*You can make more money in the ready-mixed concrete business if EVERY phase of the work is put on a fast, efficient, cost-saving basis. SMITH-MOBILES enable you to deliver more loads of uniformly mixed concrete per day than any other truck mixer. Here's why—*

**FASTER CHARGING**—Smith-Mobile's large, roomy charging chute makes it easy to spot mixer under bin gate. No troublesome, leaky hatch to open or close. Enables driver to stay in cab. Water introduced through feed opening. No clogged water bells buried in concrete.

**FASTER AND BETTER MIXING** — Smith-Mobile's efficient "end-to-end" mixing action insures uniform, well mixed concrete even on comparatively short hauls. Shrinking and mixing start the instant a batch enters drum, because drum rotates during the charging operation. Sealing door can be opened wide during mixing cycle. You can look in drum and actually SEE what's going on.

**FASTER DISTRIBUTION** — Smith-Mobile's high discharge permits steeper and longer distributing spout. Eliminates need for hoist or ramp, yet provides maximum radius of distribution. Even dry concrete can be poured directly into high forms, buckets or concrete carts without pushing concrete down the chute. Saves hours of waiting at the job. Driver can handle several extra loads each day.



*Let SMITH-MOBILES make money for YOU. Ask for catalog.*

**The T. L. SMITH COMPANY**
2887 N. 32nd Street
Milwaukee, Wisconsin, U.S.A.

THE *Modern* TRUCK MIXER

**SMITH-MOBILE**

THE *Modern* AGITATOR

A 2821-½H

# DEMPSTER DUMPSTER

Turn losses into profits the self-liquidating DEMPSTER-DUMPSTER way. One unit serving 5 to 10 detachable buckets does the work of 5 trucks. Labor is never idle . . . with DEMPSTER-DUMPSTERS on the job, "waiting for a truck" becomes a forgotten phrase. Buckets, carried on the truck well ahead of the rear axle, contribute to long truck life and low maintenance. Sizes available up to six cubic yards. In various designs.

ABOVE—Loading proceeds without interruption with DEMPSTER-DUMPSTERS . . . without a truck in sight! RIGHT—Note how easily the Drop-Bottom buckets are dumped . . . a one-man operation handled from the truck cab. The swing to DEMPSTER-DUMPSTER has been little short of amazing. See your distributor or write for the facts . . . TODAY!

*Exclusive sales territory available for responsible dealers. Write for details.*

**DEMPSTER BROTHERS, Inc.** KNOXVILLE, TENNESSEE

THE ORIGINAL BUCKETRUK

The CONCRETE MANUFACTURER

# 6 REASONS for Buying A STEARNS

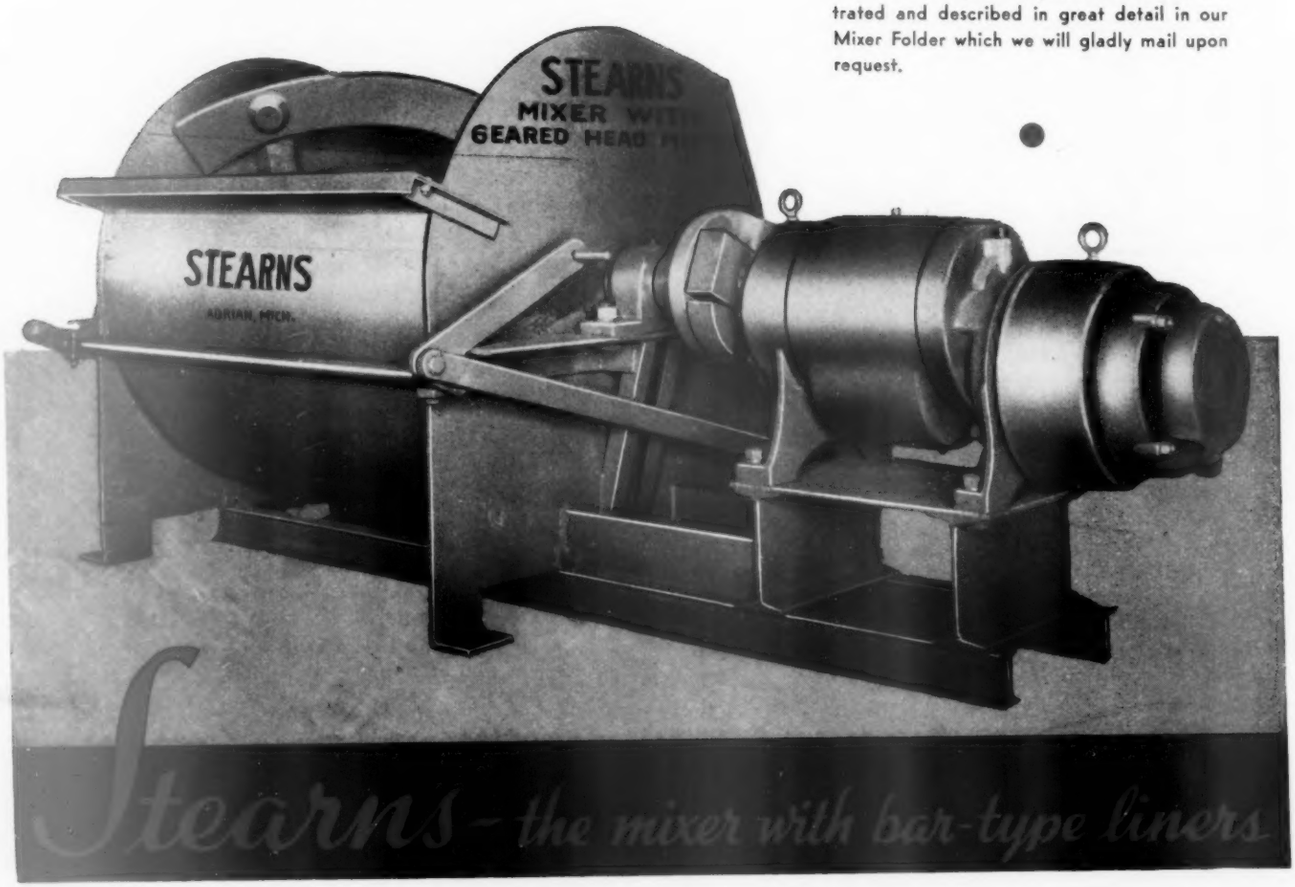
1. Heavy all steel construction in **all** sizes.
2. The mixing shell is equipped with tough, wear-resisting bar type liners—(not castings)—that are easily and cheaply replaced.
3. Mixing blades are of ribbon type and made of extra hard "Sterloy" steel. (Paddle type blades optional.)
4. Finest ball bearings that take both thrust and radial loads.
5. Discharge door control is on the operator's side—where it should be. It works easily without latches or catches—**locks tight.**
6. It has the lowest charging height of any concrete products mixer, with a convenient shelf on which to rest the bag of cement.

## Remember:

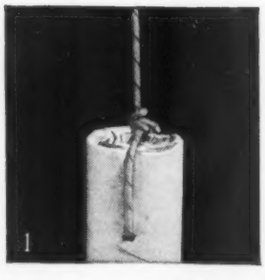
Stearns of Adrian make a complete line of modern concrete products plant equipment, including Joltcrete and Tamp Type Block Machines, Skip Loaders, etc. Write for folders covering the items that interest you.

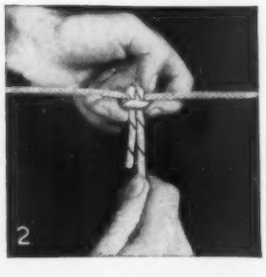
**STEARNS**
MANUFACTURING CO. - ADRIAN, MICH.
GENE OLSEN, PRESIDENT

All sizes and types of drive are carried in stock for quick shipment—all are illustrated and described in great detail in our Mixer Folder which we will gladly mail upon request.



# THE SQUARE KNOT IS *right* FOR MAIN LINE CONNECTIONS

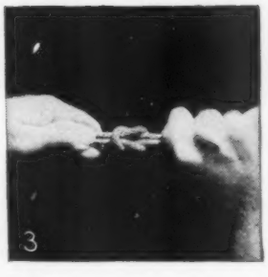



For the main surface lines connecting holes and rows of holes, use Plain Primacord. It is light in weight, flexible, waterproof, and sufficiently resistant to abrasion—ideal for this service.

The continuous main line can be made up of separate lengths, each connection being a *square* knot, as shown. This type of connection should be used above ground only—*never in a bore hole.* In fact, it is advisable to see that the Primacord used in a bore hole is one continuous length, without joints of any kind.

Primacord-Bickford Detonating Fuse, used correctly, increases blasting efficiency and decreases cost and hazard. Write for bulletins.



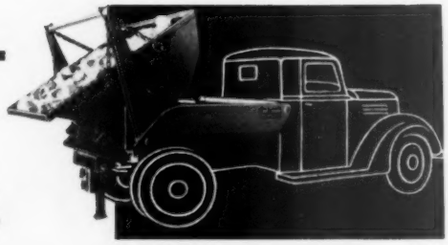
## PRIMACORD·BICKFORD
## *Detonating* FUSE

**THE ENSIGN-BICKFORD CO., Simsbury, Conn.**
*Makers of Cordeau-Bickford Detonating Fuse — and Safety Fuse since 1836*
PB25

**1.** Tie through cartridge. **2.** Half hitch branch to main line.
**3.** Connect main line lengths with square knot. **4.** Fuse and cap on end of main line

**IMPORTANT:** Branch lines should lead away from main lines at *right angles.* Avoid kinks and small loops.

# Your FIRST LINE of DEFENSE against high costs . . .



## Brooks LOAD LUGGER

Trade-Mark Registered

Are your profits threatened by an invasion of rising costs?

In the peace-time battle of competition, mechanized equipment is your first and best line of defense.

Brooks LOAD LUGGER will give you a winning advantage in material handling operations . . . wherever loading is done by hand. It takes only a small investment in equipment. In fact, with one Load Lugger and a few dump buckets you can avoid buying several trucks on the usual run of jobs.

Note the simplicity of this method, as shown in the pictures opposite . . . then send for our new Bulletin and "wise-up" on the Brooks Load Lugger System.

QUARRY OPERATIONS—There is nothing like the Load Lugger for keeping a steady stream of material going to the crusher.

ROAD BUILDING—The welded one-piece buckets will handle wet or dry materials . . . asphalt, concrete, sand, aggregates.

INDUSTRIAL USES—Load Lugger is the "plant mule" for hundreds of producers and manufacturers, saving time and cutting costs on scores of different jobs.

**Ask about our Special Introductory Offer . . Two weeks' trial of the Load Lugger . . prove it before you buy it!**

LOADING—The men fill the empties while the loaded buckets are being hauled away. Easy shoveling at knee level. No waste time waiting for trucks to pull up.

DUMPING—Driver controls automatic dumping from cab. High discharge makes it easy to spot the load. Loaded bucket can be set back on ground if desired.

## Brooks EQUIPMENT AND MFG. CO.

*Distributors in all Principal Cities*

**110 Davenport Road, KNOXVILLE, TENNESSEE**

# EASY TO CHANGE AND HOLD KILN SPEED

## When You Use G-E Direct-current Drive with Field Control

**GENERAL ELECTRIC**

*Offers*

**NOT ONE—NOT TWO—**

**BUT SIX—**

**Dependable Kiln Drives That Meet All Modernization Requirements**

1. **Direct-current with adjustable-voltage control**
2. **Direct-current with field control**
3. **Adjustable-speed, brush-shifting a-c**
4. **Wound-rotor (slip-ring)**
5. **Squirrel-cage induction**
6. **Gear-motor (may be applicable in certain sizes to any type of motor)**

**D-C DRIVE** with field control gives you close speed adjustment over a wide range. By the use of Selsyns, you can synchronize kiln and feeder for any rate of production desired. And, by the use of photoelectric pyrometer control, you have a flexible and accurately adjustable system for controlling kiln temperature. Here's a perfect combination for producing the special cements that are being increasingly specified by consulting engineers.

**THE MOTOR** for this application is the straight shunt-wound type. It not only has ample starting torque but also close speed regulation. You can get the speed you want, and hold it. Changes in load, such as might be caused by a warped kiln, have very little effect on speed. The result: you eliminate one of the variables in kiln temperature control and have added assurance that your product will be uniformly high in quality.

**MOST CEMENT PLANTS** have use for direct current anyway—for feeder motors, synchronous-motor excitation, cranes, and in the machine shop—so it's often the logical thing to plan on making the kiln drive d-c, too. Shunt-field control enables you to take the power from any d-c bus, and it seems to fit in with the economy of one-kiln plants particularly. Of course, there are usually a number of factors involved in selecting the kiln drive for any plant. Therefore, it would be advisable to talk over your requirements with our cement-mill specialists. They will be glad to work with you. General Electric, Schenectady, N. Y.

**GENERAL ELECTRIC**

652-3

# ANOTHER DU PONT DEVELOPMENT

## ...the DU PONT Superior Crimper

REG. U.S. PAT. OFF.

*Makes a WATERPROOF joint between blasting cap and fuse!*

**DIMENSIONS:**
**Width: (base) 4½ ins.**
**Height: 10 ins.**
**Weight: 10 lbs.**

**The Du Pont Superior Crimper** is a new bench-type cap crimper recently developed by Du Pont Engineers.

The crimp made by the Superior Crimper is not like the sleeve or segment type. It consists of two smooth continuous internal beads on the throat of the cap. These beads grasp the covering of the fuse so closely that a waterproof seal is made without the use of a waterproofing compound. Practical tests have demonstrated that the Du Pont Superior Crimper makes a joint more waterproof than the fuse itself.

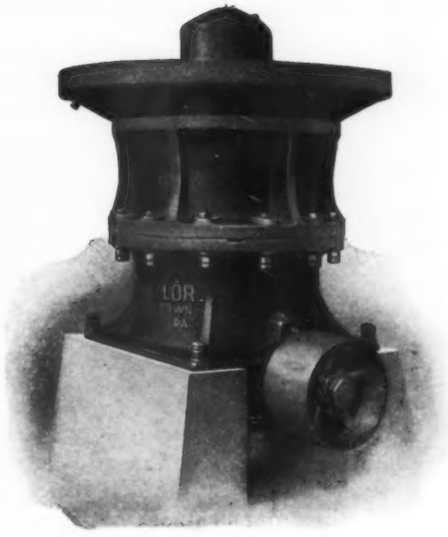
In operation, the Du Pont Superior Crimper is mounted on a bench. The freshly cut end of fuse is inserted in the cap as far as possible, and then pushed into throat of crimper until it stops. Operating the handle once makes the two crimps as shown.

The Du Pont Superior Crimper works either by foot treadle or hand. The crimper is adjustable to crimp any length of commercial cap, and is equipped with a fuse cutter.

This new crimper is still *another* example of Du Pont pioneering and leadership—to help you conduct your blasting with greatest possible efficiency and economy. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington, Delaware.

DU PONT REG. U.S. PAT. OFF. **EXPLOSIVES** *and* **BLASTING ACCESSORIES**

# TRAYLOR
# TY REDUCTION CRUSHER



A crusher, or any mechanical unit, sells or does not sell in direct proportion to the quality and economy of the service it delivers. By such criterion, the Traylor Type TY Reduction Crusher must be "tops" in its class, because rarely, if ever, has any new machine matched its impressive sales record.

The reason is, of course, that the "TY" has "what it takes"—simplicity of design, strength to spare, scientific lubrication, protection against dirt and grit and tramp iron, and non-chokability—all adding up to the satisfying of purchasers' expectations.

We'd like to send you our Bulletin 2112, and our representative would like to "talk it over" with you. Write us today!

INVESTIGATE OUR TYPE H BLAKE CRUSHER (BULLETIN 1106), AND OUR MULTI-STAGE FINE REDUCTION CRUSHER—(BULLETIN 113).

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### ENGINEERING & MANUFACTURING CO.
MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

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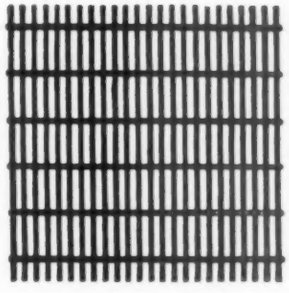
**Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Antofagasta, Oruro**



Rolled Slot

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A super wearing Steel developed to resist the abrasion and vibration of modern screening demands.

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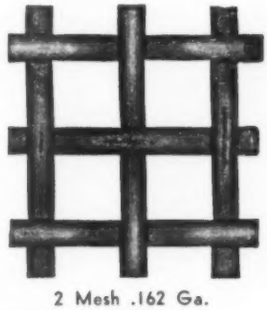
A wire cloth of guaranteed accuracy backed by fine workmanship and an effort to satisfy.

Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.



2 Mesh .162 Ga.

**THE CLEVELAND WIRE CLOTH & MFG. COMPANY**
**574 E. 78th St. CLEVELAND, OHIO**

## PAY LOADS *and* PROFITS

No ordinary buckets are the Industrial Brownhoist Clamshells. From tip to digging teeth they are as finely built as thirty years experience and modern engineering makes possible. The result . . . out on your work . . . is bigger output, lower upkeep cost and, most important, increased profits.

Your operator will get the most out of his crane when it's equipped with an Industrial Brownhoist Clamshell . . . and you'll get a bigger return on your crane investment. Complete facts are contained in Catalog 353. Want a copy?

**INDUSTRIAL BROWNHOIST**
GENERAL OFFICES: BAY CITY, MICHIGAN
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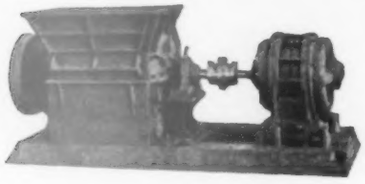
New York, Philadelphia, Pittsburgh, Cleveland, Chicago.

# AMERICAN



• Hammermills
and
• Rolling Ring Crushers

## point the way to profits

The time-proved design and extra-rugged construction built into AMERICAN Hammermills and Ringmills mean sensational performance, as hundreds of experienced operators can tell you. These machines give high production of uniform quality material—10 to 100 tons per hour—and are designed for sustained output even under the most severe operating conditions. Low power cost and minimum maintenance expense are other reasons for AMERICAN popularity from coast to coast.

*Write for Information*

AMERICAN PULVERIZER COMPANY
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## Keep your conveyor belts going with FLEXCO HD BELT FASTENERS

• FLEXCO H D RIP PLATES are used in repairing rips and patching conveyor belts. The wide space between outer bolts gives the fastener a long grip on the edges of the rip, while the center bolt prevents the fasteners from bulging.

• Avoid shutdowns and lengthen the life of your conveyor belts and bucket elevator belts by using Flexco HD belt fasteners and rip plates. Thousands of companies have stepped up the performance of conveyor lines and cut costs by using Flexco methods.

• FLEXCO H D BELT FASTENERS make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Six sizes in steel and alloys.

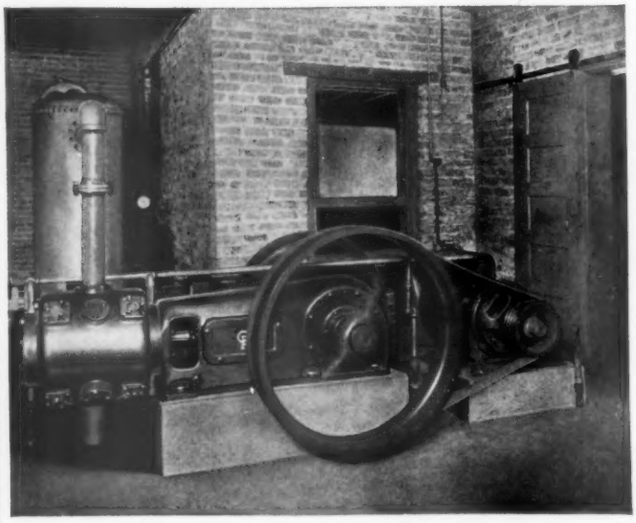
Bulletin F-100 shows exactly how to make tight butt joints in conveyor belts with Flexco HD Belt Fasteners. Also illustrates step by step the latest practice in repairing rips and putting in patches.

Write for your copy

FLEXIBLE STEEL LACING COMPANY
4623 Lexington St., Chicago

FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

## DEPENDABLE AIR FOR THE QUARRY



CP Class T single-stage, double-acting compressor is a familiar compressor in quarries. Designed for heavy duty, continuous operation, it meets every quarry need. Its Simplate Valves . . . large smooth air passages, efficient regulation and other CP features assure dependable, economical operation and low maintenance cost.

CP Class T compressors are available in belt, direct-connected and steam drive, in capacities up to 600 c.f.m. piston displacement, 100 pounds pressure. Write for Bulletin 728 or for literature describing other types of CP Compressors, including two-stage air-cooled.

**CHICAGO PNEUMATIC TOOL COMPANY**
*General Offices:* 6 EAST 44th STREET, NEW YORK, N. Y.
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STATIONARY AND PORTABLE
COMPRESSORS

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## *Know Their Rope Dope!*

Our salesmen—available through our distributors—are *trained* to analyze your rope problem efficiently. Our Engineering Staff is ready to use these analyses for recommendations for "ultimate low cost." Wire, write or consult your Telephone Directory.

UNION WIRE ROPE CORPORATION
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**UNION Wire Ropes**

A *The* "ULTIMATE LOW COST WIRE ROPE"

## THIS PORTABLE VIBRATING SCREEN

Accurately separates 3 sizes of 100 tons of material per day using only the power of a 2 H.P. gas engine or a 1 H.P. electric motor. Self-contained, easily moved. The Contractor's Screen is ideal for road and construction work, concrete block makers, cleaning and sizing in small quarries and factories.

*Send for new bulletin "CONTRACTOR'S SCREEN." It may help reduce your cost of screening*

**ROBINS CONVEYING BELT COMPANY**
**PASSAIC, NEW JERSEY**

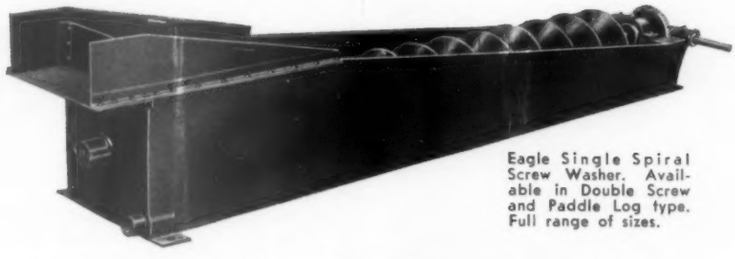
*Offices in Principal Cities*

MATERIAL HANDLING ROBINS EQUIPMENT

# "Two Wise Birds"

## EAGLE WASHERS SPIRAL SCREW TYPE PADDLE LOG TYPE

**He builds them for endurance!**



Eagle Single Spiral Screw Washer. Available in Double Screw and Paddle Log type. Full range of sizes.

**He chooses them for economy!**

All experienced dredge operators know that there is no effective substitute for Eagle equipment. EAGLE also builds the famous "Swintek" Screen Nozzle Ladder.

"WE BOTH AGREE PERFECTLY!—You simply must have clean aggregate for good concrete."
That's where sand and gravel producers and commercial inspectors line up together. They also agree that material processed through EAGLE Washers will qualify for all specifications.
These machines are backed by many years of experience in designing, building and installation. Patented and exclusive features assure maximum output on an extremely low power and maintenance basis.

Write for our big Bulletin, which gives complete details about the EAGLE Line of profit-making machines, including Washers, Crushers, Grinders and Shale Planers.

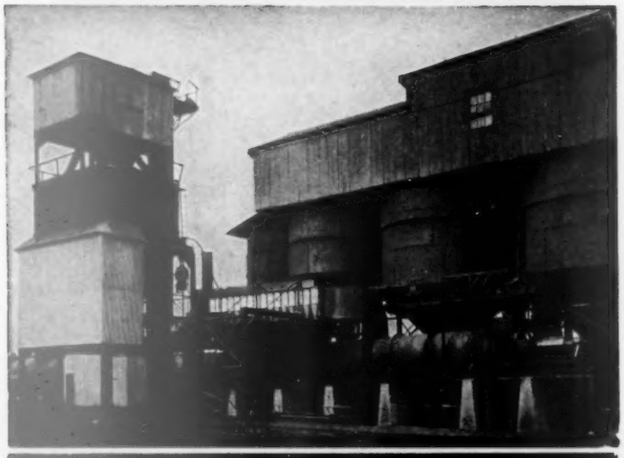
**EAGLE IRON WORKS Des Moines, Iowa**

BOTHERED with joints or repairs that loosen up? No need to be! Join your power and conveyor belts with Bristol's Steel Belt Fasteners and you have a smooth, snug joint that *stays* tight. No tearing. No loosening. No pulling out. A joint made with Bristol's will outlast the life of the belt!

Simple and easy to apply, too. All you need are a hammer and a block of soft wood.

Bristol's are available in sizes and styles for belts of any material and thickness. Free samples and Bulletin 72-5W yours for the asking. The Bristol Company, *Mill Supply Division*, Waterbury, Conn. Branches in Principal Cities.

SEE HOW EASY IT IS!



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HOT MIX —— COLD MIX

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COMBINATION UNIT FOR BOTH TYPES

CAPACITY, DESIGN AND ARRANGEMENT TO MEET ANY REQUIREMENTS

Designed and Built

— By —

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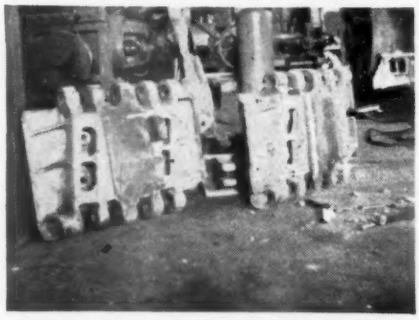

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Q-82

34 JOB PHOTOGRAPHS

The new Barber-Greene Bucket Loader Catalog 82 shows 34 photos of B-G Loaders saving time and money on different types of work including: truck loading from stock piles, road shoulder cleanup, top soil stripping, reclaiming, screening, loading scarified base, etc. Also specifications and accessories. Write for your copy.

BARBER GREENE

AURORA ILLINOIS

# McLANAHAN EQUIPMENT

for ROCK—
SAND—GRAVEL

Single and double roll and jaw crushers, hammer mills, super dry pans, steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists. Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

McLanahan & Stone Corporation
Established 1835
Hollidaysburg, Pennsylvania

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AT LOWER COST
with the Cedarapids 'Kubit' Impact Breaker

- REDUCES PERCENTAGE OF ELONGATED PIECES.
- PRODUCES ALMOST 100% FRACTURED MATERIAL.
- MAKES SMALLER SIZES WITH LESS WASTE.
- PRODUCES A BETTER GRADATION OF AGGREGATES

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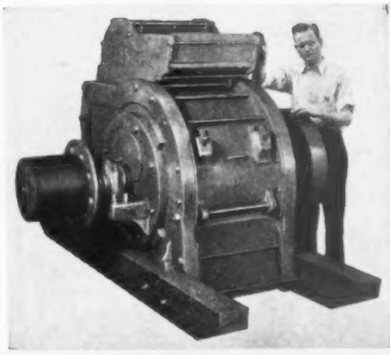
IOWA MFG. CO. CEDAR RAPIDS, IOWA



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Crushing Range of DAY Swing Hammer Pulverizers

...makes one machine serve the purpose of two or more other types of crushers. The toughest crushing jobs are "All in a DAY'S work."

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KNOXVILLE, TENNESSEE

CONVEYING SYSTEMS FOR PULVERIZED, FINE, CRUSHED & GRANULAR MATERIALS
FULLER-KINYON — FLUXO — AIRVEYOR
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WOVEN WIRE SCREENS

# LUDLOW-SAYLOR
WIRE CO. ST. LOUIS

12 HUSKY MODELS TO MEET YOUR NEEDS.

# CUT PIT COSTS
*with economical, efficient equipment*

The heavy duty features and many operating advantages built into these sturdy, powerful, fast, convertible shovels, ⅝ to 1¼ yards, will give you increased production at lower cost. Write for Catalog H-3.

BAY CITY SHOVELS, Inc.
Bay City, Mich.

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Lewistown Foundry Products
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BUCKET ELEVATORS
REVOLVING SCREENS
CRUSHERS DRY PANS

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for maximum productive-ness from your vibrating screens.
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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

**BINS**
9—2 compartment bins; 2—118 ton Blaw Knox; 1—75 ton Butler V-40; 3—72 ton Blaw Knox; 1—60 ton Butler V-40; 1—35 ton Blaw Knox portable; 1—26 ton Heltzel portable with Kron dial scale. All above with or without volume or weigh batchers.

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26—Clamshell, all sizes and types; Williams, Blaw Knox, and Owen.
6—Dragline: 1—1¾ yd. Northwest; 1—1½-yd. Omaha; 1—1¼ yd. Page; 2—1 yd. Hayward; 1—¾ yd. Page.
1—1½ yd. Pioneer Cableway Excavator bucket.
7—Dragscraper: 2—1 yd. Sauerman; 1—1 yd. Green; 1—¾ yd. Garst; 2—½ yd. Garst.

**CRANES, DRAGLINES & SHOVELS**
1—Link-Belt, K-55. Serial No. 1698. 70′ boom, 2 yd. bucket, also have 2 yd. shovel attachment.
1—Link-Belt, K-45, Speedomatic, Caterpillar Diesel 13000 with 50′ boom and 2 yd. dragline bucket.
1—Bucyrus Erie 1½ yd., 33-B, A.C. electric tunnel shovel.
1—Northwest Model 104, Serial No. 2079, 45′ boom, 1¼ yd. bucket; with 1 yd. shovel attachment.
1—Industrial Brownhoist Model D.C., 15-ton cap., with 40′ boom.
1—Link-Belt, Model K-42, Serial No. 1265, 45′ boom, 1¼ yd. bucket, also 1 yd. trench hoe attachment or 1¼ yd. shovel front.
2—Northwest Model 105, Serial No. 2053, 1645, 40′ boom, 1 yd. bucket.
2—Osgood Heavy Duty, Serial No. 2069 and No. 2087, 40′ boom, 1 yd. bucket and with 1 yd. shovel attachment.
2—Thew, ¾ yd. Gasoline Shovel with ¾ yd. shovel front and 40′ crane boom. Serial No. 2687 and No. 2801.
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1—Lorain ¾ yd. shovel, Model 79, close couple bail with reversible dipper teeth, powered by 75 HP 440-60-3 motor.
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1—Universal Model 35, 50′ boom, ½ yd. bucket.
1—Norberg Butler caterpillar mounted tunnel shovel, air driven, Model 110, shop 2168.
1—Conway Mucker type 60, 60 HP, 440-60-3 electric motor with belt boom and bucket.

**SPECIAL**
1—Blaw-Knox 120 ton lev. cap. 4 compartment steel bin with extra 100 barrel cement compartment, dial scale for weighing 1½ yd. batch and separate dial scale for weighing bulk cement, complete with Fairbanks-Morse water weighing device.

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5—Gyratory crushers: 1—No. 5 Allis-Chalmers; 1—No. 5 Austin; 1—No. 5 Gates; 1—No. 3 McCully; 1—No. 0 McCully.
10—Jaw Crushers: 3—15x36″ Universal; 1—15x36″ Cedar Rapids; 1—15x26′ Champion; 1—12x20″ Acme; 2—10x20″ Climax No. 2½; 1—9x16″ Telsmith No. 9A; 1—9x15″ Champion.
1—Set of Allis-Chalmers, smooth type crushing rolls, 42x16″.

**DREDGE PUMPS**
1—12″ Morris Heavy Duty D. C. to 100 H.P. dbl. cyl. steam engine.
3—Belt Driven: 3—Morris Mang., 1—10″, 1—8″, 1—6″.

**HOISTS**
1—2 Yd. Thomas 2 speed Class I. Cableway excavator hoist with 150 HP electric motor.
1—National 50 HP dragscraper hoist for handling 1 yd. bucket with 50 HP electric or gas power.
1—1 Yd. Cedar Rapids 2 speed dragscraper hoist with 50 HP electric or gas power.
1—1 Yd. Kern variable speed dragscraper hoist powered by 50 HP electric motor.

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CRANE—Steam McMyler 20 ton capacity, double drum, bucket operating, 50′ boom. Good condition.

LOCOMOTIVE — Steam, American 40 ton, four wheel, saddle tank, overhauled.

MIXER—Smith tilting type 56 S. two cubic yard capacity concrete mixer, excellent condition.

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Increasing boiler capacity, and we must dispose of present boiler equipment, consisting of:

1 Kewanee—No. 120K Boiler—125 HP —15 lbs. pressure, Size 72″ x 22′ 6″—Type FB—with 1½″—85% magnesia covering; with all regular boiler fittings.

1—30″ diameter x 36′ high x 12 Ga. Steel Stack

1—No. 5ACD Iron Fireman Automatic Coal Burner, with 1 air volume regulator, and shear pin alarm.

**The Commercial Shearing & Stamping Co.**
Youngstown, Ohio

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**RUBBER BELTING**

TRANSMISSION—CONVEYOR—ELEVATOR

**"V" BELTS**

FOR

PUMPS—CRUSHERS—PULVERIZERS—ETC.

**RUBBER HOSE**

FOR

AIR—WATER—STEAM—ETC.

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## NEW AND HEAVY DUTY

**Conveyor and Elevator Belting**

| Quantity | Width | Ply | Top Cover | Bottom Cover | Type |
|---|---|---|---|---|---|
| 668 Ft. | 36″ | 6 | 1/8″ | 1/16″ | Conveyor |
| 660 " | 30″ | 6 | 1/8″ | 1/16″ | " |
| 245 " | 26″ | 5 | 1/8″ | 1/16″ | " |
| 906 " | 24″ | 5 | 1/8″ | 1/32″ | " |
| 298 " | 24″ | 4 | 1/8″ | 1/16″ | " |
| 370 " | 22″ | 8 | 1/16″ | 1/16″ | Elevator |
| 296 " | 22″ | 8 | Friction | | " |
| 1455 " | 20″ | 5 | 1/8″ | 1/32″ | Conveyor |
| 403 " | 20″ | 4 | 1/8″ | 1/16″ | " |
| 1738 " | 18″ | 4 | 1/8″ | 1/32″ | " |
| 60 " | 18″ | 8 | 1/4″ | 1/16″ | Elevator |
| 288 " | 18″ | 6 | 1/8″ | 1/16″ | " |
| 712 " | 18″ | 4 | 1/16″ | 1/16″ | Conveyor |
| 1096 " | 16″ | 4 | 1/8″ | 1/32″ | " |
| 554 " | 16″ | 4 | 1/16″ | 1/32″ | " |
| 738 " | 14″ | 4 | 3/32″ | 1/32″ | " |
| 288 " | 14″ | 4 | 1/8″ | 1/16″ | " |
| 110 " | 12″ | 8 | 1/8″ | 1/16″ | Elevator |
| 226 " | 10″ | 6 | 1/16″ | 1/16″ | " |

**USED BELTING—Good Condition**

| | | | | | |
|---|---|---|---|---|---|
| 470 Ft. | 48″ | 8 | 1/8″ | 1/16″ | Conveyor |
| 210 " | 20″ | 7 | Friction | | Elevator |

**We will cut any of above rolls. Advise desired lengths and widths and we will promptly quote prices. Many other sizes in stock for immediate shipment.**

**CARLYLE RUBBER CO., Inc.**
62 Park Place New York, N. Y.

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1—General Electric squirrel cage induction motor, slightly used—440 volt—3 phase—60 cycle—100 H.P.—1050 ft. lb. pull out torque—123 amp.—900 R.P.M. synchronous speed their type Ft—Frame No. 556—Model No. 85E197GI—Serial No. 5390921.

1—Westinghouse squirrel cage induction motor, slightly used—440 volt—3 phase—60 cycle—125 H.P.—1350 ft. lb. pull out torque—160 Amp.—900 R.P.M. synchronous speed—their Type "CS" Special No. 56N475—Frame No. 774C—Serial No. 1S56N475.

*If Interested Write*

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Shovel and Crane Division
Lima, Ohio

# INVENTORY OF EQUIPMENT OF SAND PIT AT HACKETTSTOWN, N. J.

1—10-IN. CENTRIFUGAL PUMP. REVERSIBLE SPEED.
1—200 H.P. CROCKER WHEELER MOTOR. 3 PH. 60 CYC.—585 R.P.M.
1—7½ H.P. CROCKER WHEELER MOTOR.
1—20 H.P. CROCKER WHEELER MOTOR. 865 R.P.M.
1—10 H.P. CROCKER WHEELER MOTOR.
1—35 H.P. GENERAL ELECTRIC.
1—10 H.P. GENERAL ELECTRIC.
1—3 IN. CENT. PRIMING PUMP.
1—3 IN. CENT. HIGH PRESSURE WATER PUMP.
1—NO. 2 AUSTIN GYRATORY CRUSHER.
3—100 K.V.A. TRANSFORMERS. G. E.—160 V.—34500 V.—460 V.
13 LOADING GATES.
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4 LINK BELT CONE SAND SEPARATORS. DIAM. 8 FT., LENGTH 10 FT.
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1800 FT. 4 IN. PIPE.
50 FT. 5 IN. PIPE.
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1600 ft. 8″ Spiral Riveted Pipe—with flanges.

Priced for quick sale—Special Used Equipment Bulletin sent upon request.

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# FOR PROMPT SHIPMENT SUBJECT TO PRIOR SALE

***Good Used Crushers and Pulverizers***

15x24 Blake Type Jaw Crusher
24x20 Gruendler Hammer Mill (6 ton hr.)
Model K Day Lime Pulverizer (3 ton hr.)
Jeffery No. 12 Combination Lime Pulverizer (3 to 4 tons per hour)
No. 7 Mitts & Merrill Wood Hog
Gruendler—15 ton per hr. Lime Pulverizer
Gruendler—10 ton per hr. Lime Pulverizer
Reconditioned Crushing Plant includes, 15 x36 Jaw and 30x18 Roll Crusher, Elevator, Screen, Bin, Power Units (will sell in separate units)

**CRUSHER SERVICE, Box 795, St. Louis, Mo.**

**1175 Cu. Ft. AIR COMPRESSOR**
Ingersoll-Rand Type XCB, horizontal duplex, 50 lbs. pressure. With 100 HP General Electric Motor and starting equipment.

**1050 Cu. Ft. AIR COMPRESSOR**
Chicago Pneumatic Type OCB, horizontal duplex. Two stage. 125 lbs. pressure with 175 HP Synchronous Motor and starting equipment.

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# Truck Mixer Fleet

2—1½-2 yd. Jaeger Truck Mixers on De-Luxe model Fords—very good condition—ready to go—excellent buy.
2—1½-2 yd. Jaeger separate engine drive truck mixers mounted on GMC trucks.
8—3 yard Jaeger truck mixers mounted on AK Mack trucks—now operating.
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3—4 yd. Rex Moto-Mixers on 1938 Autocar Trucks. Mixers new 1938—now working.
4—4 yd. Rex Moto-Mixers on AC Mack Trucks. Mixers new 1937—now working.
2—3½ yd. Rex separate engine drive mixers, 1937, mounted on V-8 Ford Thornton drive trucks.

1—2-2½ yd. Blaw Knox Truck Mixer—separate engine drive—used one year—without truck.
3—3 yard Blaw-Knox on BF Mack—now operating.
11—4-yard Transit Mix bodies—excellent condition. Each.....$500.00

# Ready to Go

1—80 ton 2 compartment Bin.
*Pumps*—from 2" to 10" Jaeger's—Self-Priming Centrifugal.
*Mixers*—7S-10S-14S Low Charge and Power Loaders—late models.
Trenching Machine—Compressors—Vibrators.
Spencer Dust Collectors — Hoists — Engines—Parts.
½ yard Speeder Crane.
Orange Peel Bucket.
1—27E Multi-Foot Paver, Serial No. 4134, New York State specifications.
1—Speeder Crane, 55' boom, Model 192, powered 4 cyl. Hercules gas engine.
1—International Bulldozer, Model T-40, Diesel powered.

**THE JAEGER-LEMBO MACHINE CORP.**
127-04 Northern Blvd. Phone: NEwtown 9-7777 CORONA, L. I., N. Y.

# AIR COMPRESSOR BARGAINS

1—INGERSOLL-RAND Stationary Air Compressor, 2-stage, rated capacity 676 cu. ft. at 100 lb. pressure; cylinder size 15x9¼x12; complete with 100 H.P. General Electric Motor—3 phase, 60 cycle, 220-440 volt. Air receiver. All piping and accessories.
2—INGERSOLL-RAND portable 2-stage, gasoline driven Air Compressors. Actual capacity 315 cu. ft. each. Both mounted on solid rubber tires.
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1—SCHRAMM, 330 cu. ft. rated capacity, portable, single stage, gasoline driven. Mounted on four steel wheel truck.

ALL THE ABOVE IN EXCELLENT CONDITION
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## Cars You Have Been Looking For! 90 to 100

Clark G-6, *30-Yard* 50-Ton Air Dump Cars, *down-turning door* type.

Extra heavily constructed.
Floor Plates ½". Steel Wheels.

*Cheaply priced. Act before too late!*

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*"Anything* containing IRON or STEEL"

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**KILNS:**—6'x36', 8'x125', 8'x150', 9'x160'.
**DRYERS:**—3'6"x24', 5'x40', 5'x50'.
**BALL MILLS:**—5'x8', 6'x8', 5'x22'.
**HARDINGE MILLS:**—4½'x16", 6'x22", 5'x22", 8'x30".
**RAYMOND MILLS:**—No. 0000, 00, 1, 3, 3 roll No. 55 Imp.
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**2—Northwest model No. 7, with 33" Cats. Late models rebuilt and guaranteed.**
**Also other equipment.**
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Bay City 1 yd. dragline.—like new.
Koehring 301 dragline.—low price.
1½ yd. truck mounted dragline.
Several power units, 30 to 60 H.P.
315 ft. compressor, rebuilt, bargain.
Int. TD-18 used only 600 hours.

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**Used Equipment**

12'x12'x20' High oversize hopper, sloping grizzly.
20' and 32' Bucket Elevators.
30"x10' shaker screen.
Model No. U-40 Allis-Chalmers Engine.
4" Sterling sand pump No. 3558.
60"x20' Revolving Screen—structural frame, portable.
10"x20" Diamond Roller Bearing Jaw Crusher.
10"x36" Diamond Roller Bearing Jaw Crusher.
15"x36" Diamond Roller Bearing Jaw Crusher.

**New Equipment**

9"x16" Diamond bronze bearing jaw crusher, mounted on truck with 15—20 HP engine.
2—10x20 Portable crushing and elevating plants.
No. 20 Diamond Portable Crushing & Screening Plant.

**Special Prices for Quick Sale**

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1—P&H 206-B equipped with 1 Yd. clamshell bucket.
1—1¾ Yd. Williams dragline bucket.
1—¾ Yd. Page dragline bucket.

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# "Wants" and Surplus Equipment

# AVAILABLE TODAY! TOMORROW—?

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8'x125', 6'x120' and 6'x60' Rotary Kilns.
3—Direct Heat Rotary Dryers—4'6x50', double shell; 4'x60', 6x60'.
2—5'x10' Bonnot Ball Mills, steel lining, with motors.
2—5'x22' Tube Mills, silex with motors.
1—8'x30" Hardinge Conical Ball Mill, iron lined, with motor.
3—5'x27' Tube Mills, silex, with motors.
3—18 ton Steam Locomotives, Vulcan and Porter, 36" ga.
100—1½ yd. two-way Steel Dump Cars, 36" ga.
3500 Horsepower in Electric Motors, all 3/C0/440 volt; included are 9—150 H.P. and 6—200 H.P. Slip Ring Motors, 585 RPM.

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2 Roll and 3 Roll High Side—4 and 5 Roll Low Side: Nos. 0000, 00, 1 and 3. Beater type—Also Nos. 55, 60, 90 Imp. type, also No. 40 Imp. with 6' Centrifugal Separator.

### CENTRIFUGAL AIR SEPARATORS

10' Sturtevant; 8', 10', 12' Gayco; 6' Raymond, also 5' dia. Raymond "Whizzer" for attachment to roller mill.

### HARDINGE CONICAL BALL MILLS

3'x8", 5'x22", 6'x22", 7'x22", 8'x30", 8'x72".

### SYMONS CONE CRUSHERS

2 Ft. and 7 Ft. each with fine bowl.

### GYRATORY FINISHING CRUSHERS

1'8" and 2'4" Traylor TY; 410—TZ, 4' Traylor; No. 19, 25, 37 and 49 Kennedy.

### GYRATORY CRUSHERS

36" Allis-Chalmers Style "N," short shaft; 30" Allis-Chalmers Superior McCully; 42" Gates; 20" Kennedy Gearless; 20" Traylor; 20" Allis-Chalmers Superior McCully; 15" Telsmith; 13" Superior McCully and smaller sizes.

### JAW CRUSHERS

30x42" Buchanan Type "C"; 48x42 Traylor Bull-dog; 66x86 Traylor; 48x60 Traylor; 36x24 Farrel; 18x36 Farrel; 24x36 Allis-Chalmers; 8x36 Universal Roll Jaw; 18x30 Allis-Chalmers and smaller sizes.

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9'x160', 8'x150', 8'x125', 8'x100', 6'x120', 6'x60'.

### ROTARY DRYERS—Direct Heat

Ruggles-Coles, double shell: 5'x26', 5'x30', 5'6x60', 80"x45', 104"x60', 104"x85', Single shell: 4'x 30', 5'x30', 6'x40', 6'x50', 6'x60', 8'x60', 8'8"x85'.

### BALL, ROD AND TUBE MILLS

Ball Mills: 3'x5', 5'x10', 6'x6', 6'x8'.
Rod Mills: 4'x8', 6'x12' Hardinge, straight side; 5'x 10', 5'x12' Allis-Chalmers.
Tube Mills: 3'x12', 4'x16', 5'x20', 5'x22', 5'x35'.

### VIBRATING SCREENS

Allis-Chalmers 5'x10', 3 deck; Stephen-Adamson 4'x8', 2 deck; Tyler Hummer 3'x5', 4'x5', 1 and 2 decks; 4—4'x7' Leahy, two deck; 4'x8' Huron, 1 deck; 3—4'x7' Jeffrey-Traylor, 2 deck; Symons 4'x10', 4'x 12', 5'x10', 2 deck. Also Rotex, Robinson and other makes.

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2—DIESEL DRIVEN 8 ton, 36" ga. LOCOMOTIVES. D-4400 Diesel motors.
2—DIESEL DRIVEN 41½ ton, 36" ga. LOCOMOTIVES, Buda Lanova motors.
3—18 ton STEAM LOCOMOTIVES, Vulcan and Porter, 36" ga. Near Cleveland, Ohio.
2—Plymouth Std. ga. Gasoline 20 ton and 24 ton Locomotives.

### SHOVELS AND CRANES

1—2 yd. Lima Shovel, Model 850, with Caterpillar Diesel D-17,000 Engine. 1937.
1—1½ yd. Lorain Shovel "79," doub'e chain drive. Caterpillar trucks, D-13,000 Caterpillar Diesel Engine. Built late 1939.
1—2 yd. Marion, No. 38, Comb. Shovel and Crane, Buda Diesel. 1937.
1—No. 37B 1¼ yd. Bucyrus-Erie Dragline, new 1939. Caterpillar Diesel motor.
1—Bucyrus-Erie 48-B. Diesel driven Shovel, 2 yd. 1937.
1—Northwest 2¼ yd. Diesel driven Shovel, full revolving. 1937.
1—19-B Bucyrus-Erie Gasoline Shovel, ⅝ yd. 1939.
1—Bucyrus-Erie 2 yd. 50-B steam driven Dragline Crane, and Shovel. Aluminum dragline boom and lit.le used shovel front.
1—Truck Crane "Universal" 7½ ton.

### AIR COMPRESSORS

2—Sullivan Type WN-102, two stage, 550'. New 1939.
2—Ingersoll-Rand 90-CH, two stage, air cooled, electric driven, on skids, 360 CFM. 1939.
1—INGERSOLL-RAND 315-A PORTABLE COMPRESSOR.
2—INGERSOLL-RAND 830 cu. ft. Air Cooled, electric driven, 100 lbs.. 1939.
1—CHICAGO PNEUMATIC OCE 20x12x14, synchronous motor.

**We are also able to offer other sizes of Jaw, Gyratory and Roll Crushers; Gyratory Finishing Crushers; Shovels, Cranes and Draglines; Locomotives; Vibrating Screens; Elevators; Conveyors; Pulverizers; Ball, Tube and Rod Mills; Filters; Air Classifiers; Dorr Classifiers; Air Compressors, etc.**

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*Our Shops at Newark, N. J., cover eight acres*

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**Screens:** 6—4x8 1-deck Hummer Vibrating.
4x5 1-deck Hummer Vibr., with V16 and V40.
120 New Hummer "Toncap" 3x5 & 4x5 Cloth.
12-KVA Motor Generator Set, for Hummers.
3x8 1-deck Link-Belt Vibrating, Belted.
3x5 1-deck Deister Wet Vibr., V-Belt.
No. 30 Telsmith Rotary Grizzly, ⅞" ring.
Revolving type—42" diam., 20' length.
**Crushers:** 10x4-A, 10x18 Fine type.
15x9, 16x9, 18x12, 20x10, 24x36, 28x36.
8" and 12" Traylors and No. 2 Austin Gyratorys.
16" x 42" Allis-Chalmers Roll and No. 2 Williams.
12"x10" New Holland Cinder Crushing Rolls.
**Belt Conveyors:** 16"x20' and 16"x40' Port.
800' Steel Frames for 24" and 30" Belt.
36" 6-p. 1000' and 30" 5-ply Used Belt.
30", 24" and 20" Trough Belt Idlers.
16" and 30" Gravity Roller Sections.
25 Bucket Elevators, on Chain and Belt.
In Stock—Buckets, Chain, Sprockets, etc.
**Other Equipment:**
5 and 10-hp. Link-Belt Speed Reducers, 43:1.
4—8' Link-Belt Sand Tanks.
10" Manganese Sand Pump, 200-hp. Motor.
15 Centrif. Gas and Elect. Water Pumps.
55 and 60-hp. Waukeshas and 30-hp. Engines.
Portable Rails, Cars, Locomotives, etc.
11—24"-g. V-type Dump Cars, 1-yd. cap.
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70-hp. 2-drum Sauerman Dragline Gas Hoist.
¾-yd. Blaw-Knox Clamshell Digging Bucket.

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## PRICED FOR QUICK SALE

1—48" Symons Horizontal Disc Crusher (Nordberg Mfg. Co.), completely overhauled, rated capacity 1" product, 45-60 T.P.H. ..... $1,000.00
1—8" Allis-Chalmers Style N Gyratory Crusher, No. 7715, like new; used only one season. Manganese fitted, non-choking concaves, smooth head for fine crushing, extra head for coarse crushing ..... $850.00
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1—Allis-Chalmers Eccentric with manganese steel gear for No. 5 style K crusher, like new.. $150.00
1—30"x16" Wis. Foundry Crushing Rolls... $450.00
1—24"x14" Wis. Foundry Crushing Rolls... $275.00
Several Vibrating Screens, Bucket Elevators, Sand Classifiers, Electric and Gasoline Motors, 2", 3", 4", 6" Self-priming centrifugal pumps with gasoline motors; 1½", 2", 3", 4", 6" centrifugal pumps with electric motors.
1—Portable Air Compressor, on pneumatic tired wheels, 160 c.f.m. actual air.
1—Portable Air Compressor, on pneumatic tired wheels, 105 c.f.m. actual air.
Above compressors are like new, have been used only a few months.
1—Link-Belt Shovel Boom Assembly with 1 yard Amsco dipper, excellent condition, will fit models K1, K2, K35, K42.
1—Northwest ¾ yard Shovel Boom Assembly for Model 104-105.
1—P&H ¾ yard Shovel Boom Assembly for Model 206.

**LIPPMANN ENGINEERING WORKS**
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Concrete batching plant, 5 compts., 1000 yds. aggregates, 750 bbls. cement, automatic weigh batcher, full electric or manual control.
Complete concrete batching plant, 125 yds. 4 compt. bin, 200 bbls. cement.
Blaw Knox 270 bbls. bulk cement plant, complete.
150 ton Blaw-Knox 3 compt. bin, weigh batcher.
100 ton 3 compt. aggregate bin, weigh batcher.
72 ton Blaw-Knox aggregate bin, weigh batcher.
200 ton rock storage bin, steel.
50 ton Blaw Knox steel bin, portable, 2 compts.
Fuller Kinyon bulk cement unloader, portable.
Fuller C40 rotary air compressor, electric.
Gyratory & Cone crushers: K.V.S. 30, 37-S, 49; Telsmith 32; 8A, 8B; Traylor 8"; McCully 13", 8", 6"; Symons 3' coarse bowl.
Jaw: 6x12, 9x16, 10x20, 12x26, 13x30, 15x30, 16x32, 36x48, 48x60.
Jeffrey Type A 30" x 24" pulverizer.
Symons 4' x 12' double deck vib. screen.
Symons 4' x 10' double deck vib. screen.
Robins 4' x 8' double deck Gyrex vib. screen.
Telsmith 4' x 10' single deck vibrating screen.
2—77 Lorain Diesel shovels, 1½ yd. cap.
2—Marion Diesel shovels, 1¾ yd. cap.
75B Lorain gas shovel, 1½ yd. cap.
No. 50 Bucyrus-Erie steam shovel, 2 yd. cap.
Bucyrus-Erie electric tunnel shovel, 1 yd. cap.
Blaw-Knox single line clamshell bucket, ¾ yd.
Hayward ¾ yd. rehandling clamshell bucket.
Blaw-Knox 1½ yd. clamshell digging bucket.
International T-40 Diesel tractor, bulldozer.
2—Plymouth 20 ton 36" ga. gas locomotives.
28-S Ransome mixer, elec., near new, on skids.
I. R. quarry bar, complete with I. R. X-71 drill.
I. R. Model 50 Leyner drill sharpener.
Steam hoist, 10" x 12", 3 drums, Lidgerwood.
Clyde 3 drum electric hoist and swinger, 75 H.P.
Sauerman 4 yd. dragline hoist, 150 H.P. electric.
Sauerman two drum dragline hoist, 75 H.P. gas.
Steel stiff leg derrick, 30 tons, 97' bm.
4—330 cu. ft. Metalweld-Worthington air compressors, gas, portable.
1—320 cu. ft. Sullivan air compressor, Type WK 314, gas, portable.
1—220 cu. ft. Sullivan air compressor, Type WK 314, gas, portable.

**RICHARD P. WALSH CO.**
30 Church St. — New York, N. Y.

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## SHOVELS—CRANES
## ATTRACTIVE PRICES

1—80 Ton American O-6-O Switcher
1—75 Ton Baldwin O-6-O Switcher
2—40 Ton American Saddle Tanks
1—38 Ton Vulcan Saddle Tank
1—38 Ton Porter Saddle Tank
2—25 Ton Plymouth Gasoline
**STANDARD GAUGE—RECONDITIONED**

1—Marion 480 Combination Steam Shovel & Crane
1—52-B Bucyrus Dragline Atlas Imperial Diesel Engine—70 ft. Boom
1—25 Ton Browning 8-C Steam Locomotive Crane

**Birmingham Rail & Locomotive Co.**
BIRMINGHAM, ALA.

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## MISCELLANEOUS BARGAINS

BUCYRUS-ERIE GA-2 Shovel. 1 Yd. $1500.00.
2-LINK-BELT K-55 2 Yd. Draglines. 70'-0" booms.
1—Terry 25 ton Steel Stiff-Leg Derrick, 90 foot boom, Bucket Operating.
1-FLORY three drum 10x12 steam hoist with swinger.
Erie 100 Ton Three-Compartment Batcher Bin, New, Bargain.
McMyler 22 ton Steam Locomotive Crane, 50 foot Boom, Bucket operating.
Traylor 24x36 Jaw Crusher.
8000' 24" gauge Portable Track, almost new.

### SPECIALS

CHICAGO-PNEUMATIC Type VC Vert. Compressor, Two Stage 15x9x10,664' capy., being direct connected to BENZ 120 HP DIESEL ENGINE.
INGERSOLL-RAND Model 425 Portable Compressor. Actual Capy. 425 FPM @ 100 lbs. Used 4 months. Half Price.
1—INGERSOLL-RAND 520 FPM Diesel Comp. Skid Mtd.

3—Plymouth 10 Ton, 36" Ga. Gas Locomotives. Very Fine.
1—Whitcomb 4 Ton, 24" Ga. Gas Locomotive. $395.00.
1—Whitcomb 6 Ton, 24" Ga. Gas Locomotive. $395.00.
2—OWEN ¼ Yd. Clamshell with Teeth and Cwt. Like New.
26—C.P. No. 5 Drifters complete with Shells and Screens, $65.00 each with money back guarantee

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## FOR SALE

One only brand new shaft and mantle for a Traylor Model T, 10" gyratory reduction crusher.

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## DIESEL ENGINE GENERATOR PLANT

3—Duplicate 219 KVA G.E. Alternators 2400/480/240 v. 3 ph. 60 cy. 200 RPM each direct connected to 300 HP Buckeye Diesel Oil Engines. Complete. 10 years old. Perfect condition.

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Ingersoll-Rand. Type POV-2 Diesel-driven Air Compressor—2-stage—365 CFM 125 lb. pressure, with all equipment.

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Two—Style B, 10" Newhouse crushers, Manganese fitted throughout, with spare eccentrics. Complete with 100 H.P., 440 volt, 60 cycle motors and steel fabricated supporting structures.

One—Fuller-Lehigh 24" x 24" Crushing Roll with new manganese smooth rolls.

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FOR SALE

## 75-B—1½ C.Y. LORAIN SHOVEL

Completely overhauled, including large Waukesha Motor; Center Drive Crawlers, 22' Boom, 16' Dipper Stick, Serial No. R-642. Reasonable. $5500.00

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Plymouth gas locomotives, 30 and 16 tons, std. ga., MCB, air brakes. Also 3 st'm. locos.
Bucyrus 50-B shovels, 3 steam and elect., 2-yd., crawler type; also 30-B st'm. crane, 50' bm.
Locomotive Cranes; American 20 and Browning 22½-ton, st'm., 50' bms., 8 whl.; Link-Belt elec.
Allis-Chalmers 5'x10' wet grinding rod mill, with 100 HP motor; 7" Newhouse crusher.
Buckeye Diesel eng.-elec. gen. units, 260 HP.
Pioneer portable gravel crshg-screen'g plant.
Steel Guy derricks—Marine Diesel Engines.

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Brownhoist 15-20 ton 8 wheel Loco. Crane. Real buy.
Northwest 1¼ yd. type M dragline, 55' boom. Barg. Steel Bin, 100 ton, 2 compartment, good. $400, fob.
Shovel boom-sticks-dipper, etc., for P&H ¾ yd.
Conveyors—24"x40'—50'-60' & 80', inc. portables.
Drag Scraper & Slackline equipment, ¼ yd. & up.
Vulcan 8 ton std. gage gas loco.; 12 ton 36" gage.
Unit ¾ yd. 3-p revolving shovel-crane-dragline.
Wilford 1½-2 yd. shovel, ¾ swing. Priced low.
Compressor—110' Chicago-Pneumatic gas port. $500.

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5-⅜ cu. yd. Universal Power shovels in good condition. Priced right.

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Easton, Pa.

Telsmith, Kennedy & Traylor Gyratory Crushers.
Sand and Gravel Pumps, other Centrifugals.
Conveyor Equipment, 14" to 36", Belt & Portable.
Barber-Greene Loaders, Models 42, 42-A and 57.
3 Euclid Trac-Trux, 8 Yard, Pneumatic Tires.
Vibrating, Rotary Screens, all types and sizes.
Gasoline and Steam Locos., various sizes.
Dump cars, 1½ Yd. Page "C" Dragline Bucket.
Diesel Engines with or without Generators.
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Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

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All sections new and relaying rail, spikes, bolts, frogs, switches, "V" Shaped, flat and Contractors' Cars, etc. Prices cheerfully quoted.

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## RAILS "1 Ton or 1000"

**NEW RAILS**—5000 tons—All Sections—All Sizes.
**RELAYING RAILS**—25,000 tons—All Sections—All Sizes, practically as good as New.
**ACCESSORIES**—Every Track Accessory carried in stock—Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates.
**Buy from One Source—Save Time and Money.**
'Phone, Write or Wire.

**L. B. FOSTER COMPANY, Inc.**
PITTSBURGH NEW YORK CHICAGO

## DIESEL ENGINE GENERATOR SETS

3—260 HP. Buckeye DIESEL Guaranteed 20% overload for 2 hrs. dir. con. 175 kw. G.E. 2200/440/220/3/60 200 rpm. AC Generators complete. Good running condition—10 yrs. old.

**DUQUESNE ELECTRIC & MFG. CO.**
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Complete quarry plants—
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1—Suspension type Magneto with Generator for use over 26" to 30" wide belt.
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1—6½ yd. Bucyrus 320-B Electric Shovel.
16—20 yd. Magor Air Dump Cars.
90—30 yd. Clark Air Dump Cars, D/T Doors.
1—20 yd. 30 ton Electric Dump Car; 550 V. D.C. Cab and trolley operated. Nearly like new.
100—Tank Cars and Tanks.
12—50 ton Covered Hopper Cars.

**IRON & STEEL PRODUCTS, INC.**
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## Royal E. Burnham

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REDUC. TYPE: Kennedy Nos. 25, 37 & 49. Telsmith 3-F & 40. Traylor 36" TZ, 8", 10", 12". Super, McCully 6" & 10". Newhouse 5, 7 & 10". Symons Cone & Disc. Ty. 2' to 4'.

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## Index to Advertisers


*Allis-Chalmers ..... 4-5
*American Cable Div. American Chain & Cable Co., Inc. Inside Back Cover
*American Chain & Cable Co., Inc. Inside Front Cover, Inside Back Cover
*American Pulverizer Co ..... 86
Anchor Concrete Machy. Co ..... 74
Atlantic Equipment Corp ..... 92
Atlas Powder Company ..... 10

Bacon, Inc., Earle C ..... 60
*Barber-Greene Co ..... 88
*Bay City Shovels, Inc ..... 89
Birmingham Rail & Locomotive Co. 93
*Blaw-Knox Co ..... 78
Bristol Co ..... 88
Broadcast Section ..... 91-95
*Brooks Equipment & Mfg. Co ..... 82-89
Buckeye Traction Ditcher Co., The 2
Bucyrus-Erie Co ..... 18
Bucyrus-Monighan Co ..... 18
Burnham, Royal E ..... 94
Butler Brothers ..... 95

Carlyle Rubber Co., Inc ..... 91
Chain Belt Co ..... 73
Chicago Perforating Co ..... 54
Chicago Pneumatic Tool Co ..... 86
*Chicago Steel Foundry Co ..... 61
*Cincinnati Rubber Mfg. Co ..... 63
Cleveland Wire Cloth & Mfg. Co ..... 85
Concrete Transport Mixer Co., Inc. 76
Commercial Shearing & Stamping Co., The ..... 74
Consolidated Products Co., Inc. ..... 93

*Deister Concentrator Co ..... 62
*Dempster Bros., Inc ..... 79
Doscher, H. C ..... 91
Dreifus Co., Charles ..... 93
Dunn Mfg. Co., W. E ..... 77
DuPontDeNemours & Co., Inc., E. I. 84

*Eagle Iron Works ..... 87
*Easton Car & Const. Co. Back Cover
*Ensign-Bickford Co., The ..... 81
Equipment Corporation of America. 91

Flexible Steel Lacing Co ..... 86
Ford Motor Co ..... 8
Fuller Co ..... 89

Gardner-Denver ..... 16
Gates Rubber Co., The ..... 3
Gelbman, Louis ..... 78
*General Electric Co ..... 83
*Gruendler Crusher & Pulverizer Co. 54

*Haiss Mfg. Co., Inc., Geo ..... 56
*Hazard Wire Rope Div. American Chain & Cable Co., Inc. Inside Front Cover
*Hendrick Mfg. Co ..... 89
Hetherington & Berner, Inc ..... 96
Hoffman Bros. Drilling Co ..... 94

Industrial Brownhoist ..... 85
*Ingersoll-Rand Co ..... 2
Iowa Manufacturing Co ..... 89

*Jackson & Church Co ..... 76
Jaeger-Lembo Machine Corp ..... 92
*Jaeger Machine Co ..... 70

Kent Machine Co ..... 74
Kirk & Blum Mfg. Co ..... 74
*Koehring Company ..... 12

Laughlin Co., The Thomas ..... 64
*Le Tourneau, Inc., R. G ..... 7
Lewistown Foundry & Machine Co. 89
*Lima Locomotive Works, Inc ..... 91
Lime & Hydrate Plants Co ..... 16
*Link-Belt Co ..... 1
Lippman Engineering Works ..... 93
Ludlow-Saylor Wire Co ..... 89

Marion Steam Shovel Co ..... 15
*McLanahan & Stone Corp ..... 89
McLeod, Alex T ..... 95
Miles Mfg. Co., The ..... 75
*Morris Machine Works ..... 62
*Multiplex Concrete Machy. Co ..... 76

*National Wire Cloth Co ..... 78
New Holland Machine Co ..... 59
*Nordberg Mfg. Co ..... 19
Northwest Engineering Co ..... 9

Owen Bucket Co., The ..... 96

Page Engineering Co ..... 55
Pennsylvania Drilling Co ..... 94

*Raymond Pulverizer Div. of Combustion Engineering Co., Inc ..... 17
Reed Company, R. F ..... 78
*Robins Conveying Belt Co ..... 87
*Roebling's Sons Co., John A ..... 53

*Sauerman Bros., Inc ..... 75
Schramm, Inc ..... 61
Screen Equipment Co ..... 58
Simplicity Engineering Co ..... 60
*Sly Manufacturing Co., The W. W 58
*Smidth & Co., F. L ..... 22
Smith, Inc., L. B ..... 94
Smith Engineering Works ..... 11
*T. L. Smith Co., The ..... 79
Southern Iron & Equipment Co ..... 95
Stanhope, Inc., R. C ..... 95
*Stearns Mfg. Co ..... 80
Stonex Industries ..... 75
Stulz-Sickles Co ..... 88

Taylor Forge & Pipe Works ..... 63
Thornton Tandem Co ..... 57
Timken Roller Bearing Co., The ... 6
*Traylor Engineering & Mfg. Co ..... 85
*Tyler Co., W. S., The ..... 56

Union Wire Rope Corp ..... 87
Unverzagt, G. A ..... 93

Walsh Co., R. P ..... 93
*Warren Bros. Roads Co ..... 88
Wellman Engineering Co ..... 59
*Western Precipitation Corp ..... 13


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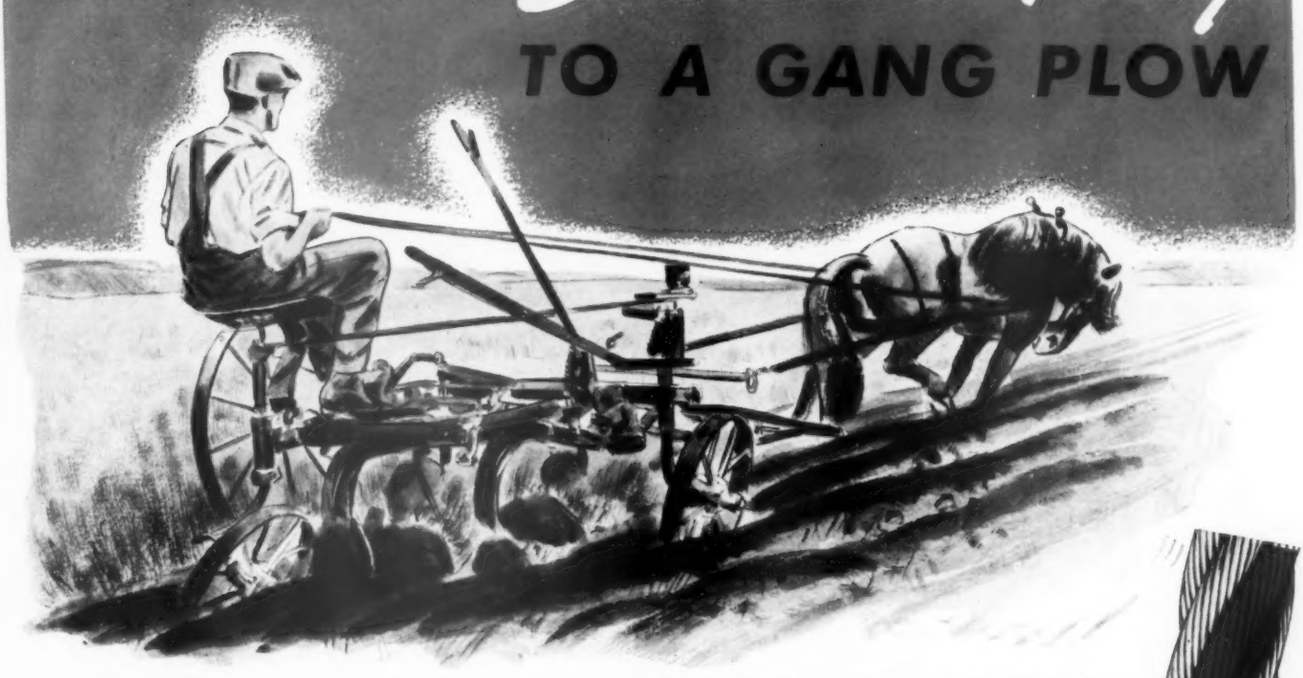

## Don't Expect Wire Rope to Work Too Hard, Either

When you overload wire rope you reduce its safety factor and thereby limit its efficiency and shorten its life. Wire rope that doesn't have an adequate factor of safety (the ratio between the rated breaking strength of the rope and the load applied) can't bend as it should and fatigues rapidly. On the other hand, when a wire rope has an adequate factor of safety its service life is materially increased. For instance, a rope having a safety factor of 6 often lasts twice as long as the same rope having a safety factor of only 4.

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Left: Showing the operation of the EASTON double hinge (1) and outriggers (2). Tractor chassis and trailer frame are relieved from dumping shock, as the outriggers rest on the hopper sill. Thus the most abusive strain in quarry haulage is eliminated, permitting the use of lighter, low-cost tractors.

*(Excerpts from a letter in our files)*

"I visited the EASTON Semi-Trailer installation at .....yesterday, and I am convinced that your units will do what we want... they handle well, starting under load easily, and mounting a 4% grade 300 feet long at about 15 miles per hour. I asked the driver to back straight and turn in not over 60 feet, and it appeared this could be done in even less room . . . the units operated easily on a moderately packed crushed stone surface, and it appeared to me that more expensive roadways would not be justified."

Other quarry operators have studied semi-trailers in actual operation. They have witnessed savings of over 25% in haulage costs. They have seen payloads of more than 16 tons hauled in semi-trailers by light, low-cost tractors. And they, too, have been convinced, because . . .

## SEEING IS BELIEVING!

Before you make any changeover or modernization of your haulage system why not let us arrange for you to visit and study a nearby installation of EASTON Semi-Trailers? It will pay you to investigate—personally. For your convenience use the coupon below.

Available in capacities to suit your requirements.

**EASTON CAR & CONSTRUCTION COMPANY**

**EASTON Car & Construction Co., Easton, Pa.**

Please arrange for me to visit and study semi-trailer haulage at some conveniently located installation, without obligation. ☐

I would like to see your natural color movies of semi-trailers in action. ☐

Please send Semi-Trailer Bulletin 148-A. ☐

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# EASTON

*25 Years Service to the Quarry Industry*

**CARS • TRUCK BODIES • TRAILERS**